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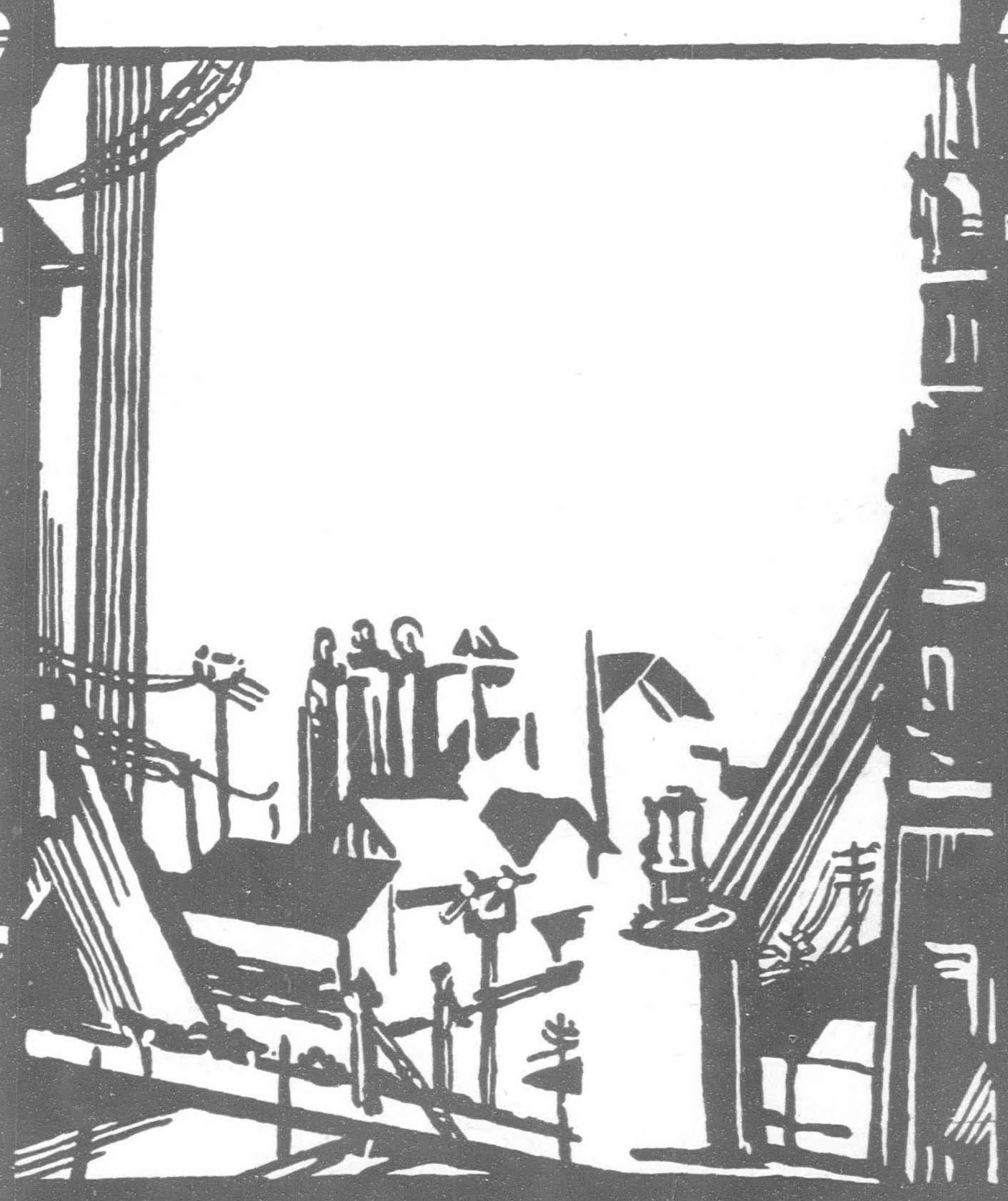

AMERICAN FOREIGN POLICY IN A NATIONALISTIC WORLD

RURAL CHINA'S COLLAPSE

EXTRA-TERRITORIALITY—TWO VIEWPOINTS

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American Foreign Policy in a Nationalistic World*

By WILLIAM E. BORAH

(Following is an address delivered by William E. Borah, United States Senator from Idaho, before the Council on Foreign Relations in New York on January 8.)

THE strong tendency of all revolutions is to break entirely with the past. A new world is to be created. A new start must be made. What men have thought before is unimportant, perhaps harmful. The efforts they have put forth, the sacrifices they have made, are to be regarded as without value. Traditions and policies which have become interwoven with the moral and intellectual fibre of a people, the habits, customs, and mode of living, the institutions they have reared at great cost of money and blood, are in revolutionary times sought to be rejected and forever put aside. Books and symbols are burned or in some way destroyed. This is the revolutionary ideal. But fortunately, it is never realized. Fortunately, the wealth—material, moral, intellectual—gathered through centuries of effort, cannot be destroyed. No revolutionary movement can wholly escape the living past. Tradition, after all, does not yield to revolutionary decrees. Experience will have a hearing. Reflection and the inexorable nexus of things bring men back to take up the broken threads, mend them if possible, preserve that which is best, separate things which are fugitive from things which are permanent, and then go forward with that patient building which is the true and dependable method of permanent advancement.

Washington, in his immortal farewell address, said: "The great rule of conduct for us in regard to foreign nations, is, in extending our commercial relations, to have with them as little political connection as possible. . . . Europe has a set of primary interests which to us have none, or a very remote, relation. Hence, she must be engaged in frequent controversies, the causes of which are essentially foreign to our concerns. . . . Why quit our own to stand upon foreign ground? Why, by interweaving our destiny with that of any part of Europe, entangle our peace and prosperity in the toils of European ambition, rivalship interests, humor, or caprice?" Thomas Jefferson stated the same principle with greater brevity, declaring: "Peace, commerce and honest friendship with all nations—entangling alliance with none."

This policy thus announced remained the unchallenged and revered policy of this nation for one hundred and twenty-odd years. Whatever differences of view may have arisen in most recent years, none were found, and none will be found, I venture to believe, to question the wisdom of this policy at the time it was announced or for more than a century thereafter. Without it, the Republic could not in all probability have withstood the ordeal of those formative years. It was an indispensable part of the scheme of free government. Together with the declaration of independence, the treaty of peace, and the Constitution of the United States, this policy made up the title deeds to our liberty and the guarantees of our independence.

There were giants in the land in those days, men of deep insight into government, of profound convictions, for which convictions they were always willing to contend and for which they did contend. But in all their contentions, upon this first great announcement as to our foreign policy there was no division. And down through the fierce years of political warfare in which men fought with the relentless ardor of great souls over almost every conceivable question of statecraft or politics, upon this policy they were united. Behind it for more than a century was the combined support and loyalty of this masterly group of men, the only body of men in all history who successfully organized, set up, and maintained a real representative Republic.

It was under this policy that we grew in strength and influence, settled our domestic problems, brought prosperity and happiness to our own people, and won and held the respect of all nations. Under this policy we announced the doctrine of neutrality and maintained it. We announced the Monroe Doctrine and saw to it that it was respected. In the midst of civil war, we sternly rebuked those who would interfere in our domestic affairs and our position was tremendously strengthened by the policy of non-interference with their affairs which we had always unwaveringly maintained. The influence of this Republic was felt throughout the world, not because of armies or navies, but rather through the force of example—we lived up to our creed, peace, commerce and friendship with all nations. We were not hated, we were not reviled because we had not done more, and, though alone, we were not afraid.

The World War brought about for the first time a wide difference of opinion touching the foreign policy of the United States. Since that time it has been earnestly and ably contended that our foreign policy, so long a part of our national life, was no longer applicable to conditions brought about by that great conflict, and that it should be abandoned once and for all. With this program was to go that part of international law relating to neutrality. We were to assume a position in world affairs the very reverse of that which we had held from the beginning of the government. We were not only to accept full part and responsibility in the adjustment of all questions of international import—and they were practically all of that nature—which should arise in Europe or in the Orient, but even in the remotest regions of the earth. We were never to assume the "immoral" position of neutrals. Nationalism and devotion to one's country were to be reduced to a minimum. Internationalism was to be the supreme, dominating force among the peoples of the world. Like other revolutions, it sought to break with all the past, its traditions, its policies, and the views and teachings of its mighty leaders.

In this revolutionary movement were two groups of individuals—working to the same end but in quite different ways. There were those who sincerely believed that the new course was the high and honorable and most beneficial course to pursue. They entertained the hope, if not the belief, that the Great War had wrought deep and lasting changes in the minds and hearts of the people of the world and that they were now ready to accept a wholly new theory of nationalism. It seemed to be their theory that war had brought all peoples into a more kindly, brotherly relationship—that in this awful baptism of blood peoples had found a new life and were henceforth to be guided by a new spirit. That those views were, and perhaps still are, sincerely entertained by many people no one can doubt.

There was another group of individuals having a large part in this program, not admirable in many respects, willing to surrender our foreign policy but not quite willing, in the face of what seemed an unsettled public opinion, to say so outright.

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* *Special Supplement to Foreign Affairs*

Hence, began that shambling, equivocal policy which found expression in a multitude of reservations and all kinds of explanations, none of which nor all of which would have preserved the foreign policy which, like Peter of old, they professed to love but would not own in the hour of crucifixion. Following the period of reservations and the consolations which seemed to flow therefrom there came into international affairs a strange figure known as the "unofficial observer," always gentlemen of high character, but always, by reason of their commission from their government, required to act as a kind of international spy, going about over the continents listening in on other peoples' business. I say "other peoples' business," because had it been our business, we should have been there in the person of a duly appointed and authorized agent of the government assuming full responsibility with all other participants. This practice brought discredit to our government, impeached before the world our sincerity, and had a tendency at least to degrade the revered policy of Washington to the level of the fugitive discretion or whims of an international interloper. Whatever happens in the future, let's be rid once and for all of this un-American and humiliating policy, if you may call that a policy, which policy has none. Wherever we go or wherever we disclose an interest, let us go as full participants and assume full responsibility with the other participants in the conference. One may personally respect, though he differs with, those who insist that our long-established policy has become obsolete and give their reasons in support thereof, although one may be permitted, I trust, to recall Chancellor Thurlow's remark in reference to the reasons given by his friend, Scott. But this shuffling, uncertain, apologetic attitude toward our American policy and toward the other peoples of the earth and nations of the world can excite nothing less than derision, if not the contempt, of all true Americans and all sincere and candid men everywhere.

The hopes entertained that the war was to give us a new world have in no sense been realized. One of the ablest of those who entertained this hope, noted for his breadth of mind and candor of thought, has recently declared: "During the 1920's I held the conviction firmly that the world was to experience a period of great international co-operation in every field. . . . Looking at the world to-day one may still hope but certainly must question the soundness of that vision of the 1920's." No less illuminating are the words of Mr. Ramsay MacDonald, spoken only a short time ago. He declared that he was "looking upon a stage with something moving immediately behind the footlights,"—"an ominous background full of shadows and uncertainties," and that confidence between nations was more lacking than ever. There is something moving behind the footlights—it is the inevitable forces of national life which often elude detection until they have begun to write their decrees.

In respect to international matters, the world has not changed, the Orient has not changed, Europe has not changed. The nations were never so heavily armed in peace times as in the fifteenth year after the signing of the Armistice. Nearly five billion dollars are annually extorted from impoverished peoples in preparation for another war. National frontiers in many instances are in effect battle-fronts. The issues between certain leading Powers are as inexplicable and irreconcilable as they were before the conflict began. The old system of the balance of power is again coming to dominate the European continent. Diplomatic moves bend to its delusive assurances. The Corridor, the City of Danzig, Upper Silesia, the problem of the minorities, Manchuria in the Orient, the vindicative judgments of the peace treaties, the inequality of nations, now the cornerstone of international law in Europe, all these problems, truculent and inexorable, serve to keep Europe armed and vigilant, and to warn us again and again that the reign of internationalism has not yet arrived. They are European problems arising out of conditions centuries old. The outside world cannot reach these problems. To make an attempt to do so would ignite the powder mine.

The answer to nationalism, it is insisted, is the nearness of all peoples by reason of modern invention and improved methods of transportation. Europe is now at our door, it is claimed, and Asia just around the corner. We therefore cannot be indifferent to their problems. We must have a part in all that concerns them, nearness makes their affairs our affairs. This matter of nearness seems to play strange pranks sometimes. It has certainly run counter to the expectations of many in the last twenty years, although we might have been well advised, since it had been doing the same things in crowded Europe for a thousand years. Nearness has not begotten there a common interest or a common purpose or even friendly relations. It has not mellowed the individuality of nations or fostered and strengthened the spirit of co-operation. It has not induced the belief that because of nearness there should be less of the national spirit. It has not put an end to war or rendered it less likely to occur.

On my father's farm, with no other dwelling nearer than two miles, and in some directions nearer than twenty, the doors to our home were never locked. If there was a key on the place, I never saw it. In our great apartments of to-day, with a multitude of families within easy reach, we have locks which lock themselves, and it is my feeling that even if these families were Japanese, Chinese, Italian, French, or Russian, instead of Americans, we would still keep the self-locking locks on the doors. Familiarity does not necessarily breed respect and propinquity does not ordinarily beget confidence. Europe is as far away to-day, likewise the Orient, in everything which makes for the community spirit, for social understanding, for political accord, as it was when the greatest of political philosophers, the most profound student of Europe this country has ever known, joined, with the wisest of political leaders in warning the American people against entangling alliances of any kind.

It is one of the crowning glories of the world that we have different peoples and different nations and different civilizations and different political concepts. Standardization may be all right for cattle and sheep and swine of all kinds, but it is not applicable to peoples, or nations, and it is not in accordance with the divine economy of things.

Another revolution, therefore, has failed. It had to fail. It could not escape the living past. It did not weigh sufficiently the inertia of human nature, it underestimated the strength of those ancient prejudices and fears, as well as those ancient faiths and beliefs, the intellectual and moral paths over which men and women had trodden for centuries. The fight against nationalism has lost. It was bound to lose. It was a fight against the strongest and noblest passion, outside of those which spring from man's relation to his God, that moves or controls the impulses of the human heart. Without it civilization would wane and utterly decay. Men would sink to the level of savages. Individuality in persons is the product of the most persistent and universal law of nature. It is woven of millions of subtle and tireless forces. No power can change this law or frustrate its operation. This is equally true of nations. Internationalism, if it means anything more than the friendly co-operation between separate, distinct, and wholly independent nations, rests upon a false foundation. And when undertaken, it will fail as in the name of progress and humanity it should fail.

Out yonder in the sad bean fields of Manchuria, empty formula met reality, internationalism encountered nationalism, and the pathetic results are recorded in the great disappointment of many wise men. In an old Greek tragedy you will find this line: "Alas! How dreadful to have wisdom where it profits not the wise."

Nationalism, pride and love of country, is a passion, peculiar to no people, indispensable to the welfare of all. To undertake its destruction is madness. To foster it, cultivate it, direct its finer qualities along high and honorable and peaceful lines, as exemplified in the precepts and examples of Washington, Jefferson, Jackson, and Lincoln, with countless other names that will readily come into your memory, is the highest mission, the noblest calling, in which men and women associated with public affairs can engage and to which a free people can devote their aims and consecrate their energies.

Its maintenance has cost blood. So has religion. It has entailed suffering beyond the power of words to paint. So have all the creeds and faiths of men. But it is worth all it has cost. Ask the Polish people, taking a single instance from the crowded pages of history. Frederick the Great, in his old age writing to Voltaire, said: "Now that Poland has been settled with a little ink and a pen, the 'Encyclopedia' cannot declaim against mercenary brigands." That was when they divided Poland. But Poland had not been settled by a little ink and a pen. Physically dismembered, her national spirit lived on. Homeless, as it were, it appeared upon every battlefield for liberty and fought for the oppressed in every land under the heavens. Without a country of its own, this Polish spirit of nationalism made the land of the downtrodden among all peoples its home. When the World War

came, near two hundred years had intervened since the crime was committed. But there was no stronger feeling of nationalism anywhere to be found than in this dismembered country. And like a ghost of retribution, it pursued those who had inflicted what was supposed to be a mortal wound to their utter undoing. Shall we hope to achieve for the world what the despoilers sought to do with Poland ? Even though we employ oceans of ink and millions of pens we cannot destroy nationalism ; our effort will be just as futile as was theirs. War may spread its ruin, you may wreck the fundamental law and uproot the institutions of your country—these are but the fruits of man's efforts. But a higher power has planted in the human breast devotion to country, and all permanent progress must rest upon that basic fact.

It is a nationalistic world, intensely so. There can be no doubt about that. Everywhere the national spirit is evoked, fostered and religiously maintained. Whatever we may think as to some of its policies and tendencies, we must admit that under its welding, cementing, driving power, different peoples have been lifted into a region of exertion and consecration nothing less than amazing. In countries where there was debility, incompetency, and utter demoralization among the masses, in this spirit of nationalism there is now strength and vigor and hope. Trampling under foot the false and feeble philosophy which would disparage the healing, uplifting power of patriotism, they sacrifice, suffer and endure and find their highest compensation in the increasing vigor, prestige and honor of their country. These conditions and these sentiments are not likely to change in the near future.

If a foreign policy should be offered to these nationalistic nations, which would not fit into, serve and augment their nationalism, it would be rejected. Such a policy was offered to Japan. It was rejected. Where would a foreign policy based upon internationalism find reception in Europe or in the Orient ? Like the dove from the Ark, there would be no place for it to light. When the Security Committee of the League several years ago sought of Great Britain her views upon the terms of the Covenant, the Committee was plainly informed that Great Britain would determine for herself whether there was a breach in the Covenant and would determine for herself what, if any, action she would take in regard to the breach if it occurred. That was nationalism. Who would expect Great Britain to do anything different ? And who would long respect her if she did do anything different ? The invasion of the Ruhr, Corfu, the seizure of Manchuria, these things indicate rather strongly that all schemes of international co-operation must fit into national realization. Judging the future by the past, it will always be so. Europe has not changed in this respect, and I venture to say, in the interest of civilization, it is well that she has not changed. Europe, with her developing nationalism, may throw many dark shadows upon the future. But Europe, without the national spirit, would be hopeless beyond redemption. Nationalism does not necessarily of itself mean militarism or war, as shown by our own history. But whatever it means, anything is preferable to suffocation in the fetid atmosphere of national decay. National decay begins where nationalism ends.

I am far more concerned about our domestic problems than I am about our foreign affairs, although our foreign policy will greatly help or hinder the nation in dealing with our domestic problems. It will be a long time, I venture to believe, before there will be any necessity or any justification for the United States *engaging in a foreign war. But the questions at home* are imminent, they are upon us, not only those which have to do with the depression, but many which are even of a graver and more permanent nature, problems which have their roots deep down in our whole social and political structure. You would not expect a discussion of these questions this evening. It is sufficient for the purposes of the evening to merely indicate some of them. Our stupendous debt burden, public and private, some two hundred and twenty billion dollars, our constantly increasing tax burden, city, county, state and national, the chronic waste of public money, the utilities problem, conservation and proper use of our natural resources, the banking question, the money question, the question of the more equitable distribution of wealth. These, and many more problems, push now for consideration. No scheme on earth can give us permanent contentment or permanent prosperity until they are solved. Indeed, they were contributing causes of the depression.

The guarantee of our national efficiency, prestige and strength, notwithstanding the many problems with which we must deal, and certain tendencies which seem to threaten our institutions, is to be found, not alone in wise leaders but even more in a united and a wise people—united not only by constitutional forms and one flag, but united in spirit and exaltation of purpose. After all, the source of power in this country under our government is the people. If at that source there is wanting poise and judgment and devotion and wisdom, this will inevitably be reflected in unstable policies and unwise laws—the people "must nobly save or meanly lose the last best hope of earth." Our foreign policy therefore should be one best calculated to unite our own people, morally, spiritually and economically, to inspire them with a sense of national fidelity and personal responsibility.

This country has within her boundary people from almost every land under the sun, still conscious under certain conditions of the "mystic chords of memory." Every civilization has made its contribution to the American civilization. How easy to transfer the racial antipathies and political views and controversies of the Old World into our very midst. Once abandon our policy of aloofness from European controversies, and we bring these European controversies into the American home and into our national life. We are constantly warned how persistently that transfer even now takes place. Only recently the bitterness, the intensity, of a European controversy, nerved the arm and guided the hand which grasped the dagger of the assassin, not only in our very midst but under the most sacred and solemn surroundings.

Eschewing policies, therefore, which tend to keep alive former attachments and the political controversies of the Old World, we should exert to our utmost the healing, cementing power of patriotism and mold one hundred and twenty million people into one invincible, intellectual, economic and political force for the enactment and administration of just and equal laws.

In the years immediately ahead, believing that I was laying the foundation for the adjustment of all our problems, believing that I was engaged not only in saving government but in saving souls, not only preserving institutions but preserving human liberty, like Peter the Hermit with his tongue of fire, I would preach united national aims and ideals, I would instill anew the great truth that democratic institutions are the only hope for the personal worth, the dignity, and the individual liberty of the citizen. I would frame all laws and shape all policies, foreign and domestic, with that great end in view. In no other way can we hope for contentment and unity at home and respect and power abroad.

In conclusion, permit me to say that I believe in the foreign policy which offers peace to all nations, trade and commerce with all nations, honest friendship with all nations, political commitments, express or implied, with none—the policy which not only in fact respects the rights and sovereignties of other states and nations without distinction of great and small, and particularly upon this Continent, but which would also refrain from words or acts that would seem to challenge those rights. As an evidence of that faith, I would at the present time abandon what is known as the Platt Amendment as irritating and humiliating to Cuba and as imposing upon the United States an impossible task. Under the shelter and the inspiration of such a foreign policy I would foster and strengthen that brand of Americanism which believes in the worth, the efficiency, and grandeur of constitutional democracy, in the vigilant preservation of the personal liberty and the individual privileges of the citizen, realizing that our institutions and the whole vast scheme of democratic government depend upon our ability here on this western continent to harmonize the rapacious economic forces of the modern world with the political freedom and economic rights of the individual. Thus, armed with a sense of justice toward other nations on the one hand and a sense of duty toward our own people on the other, this nation will remain at peace with all nations who want peace, and if there be those who do not, and will not, have peace, we under such circumstances need have no fear.

There is no creed or faith, no political principle or form of government, but must at some time or other undergo attacks—and this seems to be one of the periods of challenge and general assailment. We read of a movement lately initiated in one of the leading countries of Europe to delete the Ten Commandments, presumably that part which says : Thou shalt not kill ; to edit the Lord's prayer, since that perfect supplication encompasses all men regardless of race or creed ; to abolish Christianity, and conform the teachings of the Nazarene to the practices and principles

of their political leader. This wicked and blasphemous exhibition of diseased minds seems only a little more impious and no less vain and impotent than the persistent attacks everywhere encountered upon popular government, the right and capacity of the people to direct and manage their own political affairs. Here in this country and elsewhere, either by those who in their own land have destroyed the last vestige of personal liberty, sending to prison and to the torture chamber men and women because of race, religion or political opinions and sacrificing all rights of the people to the gratification of personal power, or by those in our own land who consult appearances rather than realities and mistake surface indications for the deep currents which move below, we hear the solemn pronouncement that popular government has failed and constitutional democracy is dead.

We need not be dismayed but we cannot be unconcerned. The right to worship according to the dictates of one's conscience, the right to freedom from persecution on account of race, are parts of that political liberty, that freedom from oppression which is the very life-blood of democracy. These things, together with free speech, a free press, the right of assemblage, and those guarantees the sum total of which make up the inestimable blessings of personal liberty, are the things for which democracy stands. They are the things for which we stand. And I venture to believe that we will not fail to preserve them. Looking backward and looking forward, proud of our past and confident of our future, we shall find our highest service, not only to our own people, but to mankind and to the peace of the world, in transmitting these principles unimpaired to succeeding generations. This is our supreme duty. I believe that the foreign policy of Washington and Jefferson and Lincoln will best enable us to meet and discharge that duty. I am, therefore, at all times, in periods of turbulence or in periods of calm, and without apology and without compromise, committed to the support of that foreign policy.

This, it will be said, is isolation. It is not isolation, it is freedom of action. It is independence of judgment. It is not isolation, it is free government—there can be no such thing as free government if the people thereof are not free to remain aloof or to take part in foreign wars. People who have bartered away or surrendered their right to remain neutral in war have surrendered their right to govern. In matters of trade and commerce we have never been isolationists and never will be. In matters of finance, unfortunately, we have not been isolationists, and probably never will be. When earthquake and famine, or whatever brings human suffering, visit any part of the human race, we have not been isolationists, and never will be. In all those matters and things in which a free and independent and enlightened people may have a part, looking toward amity, toward peace, and the lessening of human suffering, we have never been isolationists, and never will be. But in all matters political, in all commitments of any nature or kind, which encroach in the slightest upon the free and unembarrassed action of our people, or which circumscribe their discretion and judgment, we have been free, we have been independent, we have been isolationists. And this, I trust, we shall ever be. If there be any truth established by the experience of nations, it is this: That to accommodate your foreign policies to the demands or in the interest of other nations at the peril of your own security, is to invite contempt, and it seldom fails to earn a more substantial punishment.

In recent years much has been said, especially from abroad, about the provincial American. Those who discuss this and kindred matters modestly pay tribute to their own worth by speaking of world vision and of a wider human sympathy. One need hardly linger to discuss the subject. Regardless of what may be said by those whose purposes are apparent, let us hold fast to those political principles and foreign policies which others call provincialism but which we call Americanism. It has served us well. It fits in with our scheme of democracy. It has built a civilization whose capstone is personal liberty. It may have its faults, as what earthly scheme has not? But all the world will have to testify that in great emergencies, in sublime moments, when civilization hangs in the balance, it is wanting neither in sympathy nor in courage, and whatever faults it may possess are buried in the depth of a great unselfish and heroic purpose. It has no taste, no aptitude, for the hazardous enterprise of uncovering aggressors or chastising national renegades. Here in its God-ordained home between two oceans, watchful of its own interests and vigilant in the defense of its rights, it covets nothing of others save the peace and friendship of all. It does not, and it never has, shrunk from its duty to civilization. It will not disown any obligation which human liberty and human justice impose upon a free people. But it does propose, I venture to prophesy, to determine for itself when civilization is threatened, when there may be a breach of human rights and human liberty sufficient to warrant action, and it proposes also to determine for itself when to act and in what manner it shall discharge the obligations which time and circumstances impose.

Rural China's Collapse*

By YAO HSIN-NUNG

Of all the vital issues of distressed China to-day, the one of first importance and urgency is the rural problem. For thousands of years rural China has been the pillar of the nation's economic structure. Its downfall implies, therefore, the ruin of the entire country. In normal times, the Chinese peasants, toiling throughout the year, mutely and contentedly feed the nation. But in the past twenty-two years of the Republic, they have suffered time and again devastation of natural calamities and impoverishment of man-made disasters, till they find themselves to-day no longer able to bear, as their fathers did, the growing national economic burden.

They cry for help but their feeble voices are drowned completely in the deafening clamor of factional disputes and resultant civil wars. The return from their yearly toil, pouring into the Government treasury and the warlords' purses, only brings back more torture instead of relief. Forlorn and desperate, they desert their farms, turn into bandits or Communists. This makes the situation worse and affords the militarists additional excuses for their gladiatorial adventures.

The cumulative evils and misfortunes of all these years have reached the point of volcanic eruption that threatens to make a Pompeii of China. Now, in the face of the prevailing economic crisis and the new party-split, it is high time to survey the field in the light of scientific statistics and to reflect on the problem as a whole. The object is merely to show the immediate importance of rural recovery in China as based on facts rather than on partisan opinions.

Rural China's Role

The rôle of rural China in the economic life of the country is most plainly shown by the census of her population. According to data supplied by the National Bureau of Statistics, there are 58,569,181 farm families in the whole of China, constituting 74.5 per cent of a total number of 78,568,245 families. Some authorities maintain that the percentage should be 80 per cent or more, but such a difference need not be discussed here. Roughly then, if the total population of China is 483,004,025, according to the 1933 *Shun Pao Year Book*, the rural population will be approximately an overwhelming majority of 360,000,000. It logically follows that if these millions were reduced to a state of collapse, they would bring the whole nation down with them.

Besides its towering numerical superiority, the rural population of China is in the last analysis her only important producer. Industrially backward, China has only about 1,445,000 productive

**The North-China Daily News*, Shanghai.

laborers, according to the estimate given in the *Labor Year Book* of 1930. That is only about 0.3 per cent of the entire population and, by comparison, rather negligible. We do not know of any more conspicuous number of Chinese people who are engaged in productive pursuits. We only know that there are 2,245,536 mercenary soldiers (excluding irregulars) who constitute the bulk of the "National Defense Forces," and about one hundred and nineteen millions of urbanites who consume instead of producing.

The Country's Production

In a normal year, the chief farm production of China excluding Tibet and Mongolia, runs into about three hundred million catties, as indicated in the following Government figures :

	Catties
Cereals	215,365,854,000
Beans	27,736,773,000
Roots	33,477,989,000
Others	13,112,181,500
Total	289,692,797,500

In addition to this, the annual amount of farm by-products is estimated to be worth $2,239,946,968.

These solid facts enable us, even without the help of an economist, to understand the importance of rural China in the economic life of the country. Imagine a family of ten persons of whom seven earn the living of the whole. How important these seven must be ! And if they should one day become invalids, what would that mean to the survival of the family ?

Yet, in spite of his value to the nation, the life of the Chinese peasant has become a tale too sad to be believable. According to Kuomintang statistics, his economic status may be described by five different categories as the following :

Status	*Amount of land owned or tilled*	*Percentage of population*	*Percentage of total land*
Poor farmer ..	1— 10 mow	44	6
Mediocre farmer ..	10— 30 ,,	24	13
Well-to-do farmers	30— 50 ,,	16	17
Petty landlords ..	50—100 ,,	9	19
Great landlords ..	Ab. 100 ,,	9	43

The classification of farmers is indicated in the following :

	Per cent
Landed farmers	45.4
Tenant farmers	39.4
Employed farmers	9.0
Unemployed and quasi-bandit ruffians	6.0

This shows that more than half the Chinese peasants are landless. As denoted in the ensuing figures, their percentage is steadily increasing :

Year	*Land farmers Per cent*	*Semi-landed farmers Per cent*	*Tenant farmers Per cent*
1918 ..	53	21	26
1919 ..	49	19	32

(*From a Japanese estimate*)

and,

Quinsan district	1905 ..	16.0	26.0	57.4
	1914 ..	11.7	16.6	71.7
	1924 ..	8.3	14.1	77.6
Nantung district	1905 ..	20.2	22.9	56.9
	1914 ..	15.8	22.7	61.5
	1924 ..	13.0	22.6	64.4
Suchien district	1905 ..	59.5	22.6	17.9
	1914 ..	42.5	30.6	26.9
	1924 ..	44.0	30.5	25.5

(*From an investigation by Chiao Chi-min*)

Low Living Standard

This irrational distribution of land is coupled with alarmingly low income rate and a standard of living hardly human. The average farm family has 5.62 members but its average annual income is about $150, or $26.6 per capita. The figures given by the International Famine Relief Commission indicate that the annual income of 76.6 per cent of the farm families is below $200 but their average expenditures amount to $228.32. That means that only 23.4 per cent of them is able to live without going into debt, and this only in a normal year !

High rent, low wage, exorbitant taxes, usurious interest on credit, and unfair exploitation of cereal merchants are responsible for reducing the peasant income to such a deep-sunken level. The average annual rent in Kiangsu, Kuangtung, Chekiang, and Hunan, is about $8.44 per mow, or 9 per cent of the land value. According to the *Shun Pao Year Book*, 51 per cent of the returns from the land go to the landlord, and the figure is tending upward. In 1921, for instance, the rental rate in Kiangsu was $3.50 per mow but in 1927 it leaped at $7.86.

In contrast with the high rent is the low earnings which according to the average of 17 most prosperous districts, are $37.69 per year. In some places, the figure is as low as $10, or hardly three cents per day !

The Curse of Taxation

Yet, in spite of all these, they do not enjoy a light tax. It is impossible to get natural statistics of all descriptions of taxes which are too numerous and locally different to enable calculation. The *Ta Kung Pao* of Tientsin reports that in the Chinkiang-Huai-an districts the total amount of extra-taxes on land exceeds the regular ones ten times ; in Shaoyang the regular land tax of each nominal tael means fourteen dollars in actual payment. In Shensi according to an account in the *Sian Daily News*, the market price for each picul of rice is about three or four dollars but the peasants are made to pay more than twice as much for taxes on it. What is worse is the fact that the land taxes, regular and extra, are not only overburdening but are actually collected many years in advance. In Szechuen, with reference to the July 3 issue of *The China Times*, they have been collected to the 85th year of the Republic !

The most comprehensive and scientific figures of taxes available are perhaps in the book, "Ting Hsien : A Social Survey," by Franklin C. H. Lee of the National Association of the Mass Education Movement of Chihli Province. According to this book, the average annual land tax from 1927 to 1929 for the whole hsien was $107,712,203, or about $2.3 per mow. But the extra-taxes in 1927 alone amounted to $236,251,082, or more than twice the regular ones. These taxes are collected one year in advance and besides that, a gross amount of $328,409,269 of other taxes are to be paid by the people of whom are peasants constitute 99 per cent. Yet, Ting Hsien, in comparison with most parts of China, is a paradise !

Struggling under such pitiful conditions, the peasants are compelled to resort to constant borrowing. There were, up to 1932, 763 co-operative societies in all China, a few banks extending rural credit, and still fewer charity institutions, such as the International Famine Relief Commission, from which the peasants may secure loans at a comparatively reasonable rate. But these reach only an inconspicuous per cent are of the farmers. Most of them only have access to pawnshops or money-lenders. The average rate of interest charged by pawnshops is between two and three per cent per month and the time limit for redemption is usually below six months. In some places, such as Shensi, the annual interest is often above 100 per cent. The average rate charged by money-lenders is about 2.7 per cent each month but often it runs to six per cent. There are various other forms of usury, such as that prevailing in the silk districts of Kiangsu and Chekiang, where 100 per cent interest is charged for a period of 40 days, and that prevailing in Nantung, where four dollars worth of cotton is collected for a loan of one dollar cash to three months.

With the merciless landlords and fierce tax-collectors on their heels, the peasants have to knock at Shylock's door and agree to his pound of flesh. In most parts of China they have to sell or mortgage their produce even before the seed is sown. That is, in general, the way they manage to drag their days on to a future, dark and lacking in certainty.

When they have reaped the results of their year's toil from the land, they have to face an unfavorable bargaining with the cereal merchants. According to *The Provincial Industry of Kiangsu*, the sale price of rice at the place of production is always between sixty and seventy per cent lower than the market price. The farmers, of course, know what the fair price should be, but their

urgent need of money—the rent, the taxes, the loans plus interest, the household expenditures, and so on—is so imposing that they cannot withhold their produce for a better day. This weakness gives the merchants the key to winning bargaining and the farmer often sells even at a quotation lower than the net cost of production.

Thus the fruits of their labor pass out of their hands, leaving them in a tangle of debt, in hunger and distress. Almost alone they feed the nation and earn for it existence, yet their own livelihood is scarcely above the level of animals.

Rural China is now bankrupt. Millions of farmers have perished. Millions are deprived of their homes, land, and all means of subsistence. Millions are struggling between life and death. Even the luckiest ones are suffering terribly under their ever growing burdens.

The past twenty-two years have a long-drawn out record of misfortunes—flood, drought, cyclone, hail, frost, sand, fire, earthquake, mountain-slide, rat, wolf, locust, insect, " bandits," soldiers, pestilence, and civil wars. Available statistics show that annually from 1928 to 1931 such calamities affected approximately forty millions, covering an area of 600 out of 1,939 hsien-districts. These figures do not include those which have not reported ! The Yangtze flood of 1931 alone deluged an area of 97,000 square miles, equal to the size of England or New York State, and directly affected a farm population of 25,200,000 with a damage of $1,932,-000,000. The year 1932 witnessed fewer calamities, but there were five provinces more or less affected, without counting Manchuria and those districts that were then theaters of civil conflicts or of defensive wars against Japanese aggression. Last year the Yellow River followed in the wake of the Yangtze and rendered a great part of North China nearly barren. There are yet no complete statistics to tell about this additional tragedy, but in western Shantung alone, according to an official report, the flood area covers 5,047,630 mow, affecting 6,527 villages and a population, predominantly rural, of 1,774,019 with a damage of $61,038,535. In the absence of summary reports, we cannot have an exact idea of the extent of all last year's calamities in the rest of China, but we have reason to believe that they are hardly less serious than those of 1931.

The Cost of Wars

To crown the long list of disasters there is the weary long wrestling between the National forces and the Reds. According to a recent report by General Liu Chen-hua, of the 64th Division Army, and a Japanese estimate, we have a rough figure of the war victims and property damages since 1927 in five provinces :

	Province	*Killed*	*Exiled*	*Property damage*
General Liu's	Anhwei ..	170,270	179,460	$ 47,867,500
reports	Honan ..	804,436	537,040	126,057,023
	Hupei ..	246,551	946,114	477,033,880
Japanese	Kiangsi ..	186,000	2,100,000	650,000,000
estimate	Hunan ..	89,000	5,793,000	300,000,000
Total	5 provinces..	1,414,256	9,544,614	$1,600,958,403

If we take into consideration other provinces such as Szechuen, Shensi, Fukien and so on, where the local forces have been in constant clash either with the Reds or between one another, we shall doubtless get figures several times as large as those above. That means that the people have been suffering yearly, from internal fighting, a disaster much greater than the Yangtze flood !

Then, there is the tremendous burden of national debts and loans, domestic and foreign. The following is a glimpse of the load :

Domestic loans..	$1,703,109,588
Foreign loans : (before 1931, £224,936,601).. ..	1,349,781,606
(since 1931, G.$100,000,000)	303,030,303
Nishihara loans : (estimate by E. Kann)	139,500,000
Boxer Indemnity : (Haikwan Tls. 450,000,000) ..	630,000,000
Loans issued by local governments	150,500,000
Total indebtedness	$3,645,921,497

At the bottom of this pyramid of debt is the Chinese farmer, the ultimate source of wealth for the Government.

Foreign Competition

As if all other troubles were not enough, they must also face the competition of foreign farm-products. The statistics of the Maritime Customs indicate a steady increase of imported produce in recent years. Of rice alone, we have the following figures :

	Piculs
1929	10,824,065
1930	19,892,784
1931	10,740,810
1932	22,486,639

Take again the statistics of the total import and export of rice since the first year of the Republic, we find :

	Quantity Piculs	*Value Hk. Taels*
Imported rice	226,446,069	1,026,820,785
Exported rice	2,222,069	9,652,092
Unfavorable balance ..	224,224,000	1,017,168,693

Such an alarming quantity of foreign cereals on the market is certainly a great menace to home production. Heavy rent, exorbitant taxes, high freight charges, and poor means of transportation, put Chinese farmers in a decidedly disadvantageous position to compete with cereal importers. In 1932, there was a bountiful harvest in a great part of China but the market price had dropped so low on account of over-supply that the farmers could not even get back enough to cover their net investment. Thus in a good year they go into debt and in a bad one they go into destitution. And there are three hundred and sixty millions of them !

There are yet other factors that impoverish the peasants, such as depreciated paper-money, poppy-growing, and so on. In the absence of adequate statistics, we do not venture to give an estimate of their effects here. But any one who is familiar with rural conditions in this land, knows well that these factors, together with taxes, rents, interest on loans, and unfair bargaining, constitute greater evils than flood, banditry, or the two combined. From the latter the people may flee with luck, but from the former there is no escape.

The Farmers Alternatives

Facing calamities on all sides, the farmers seem to be compelled to take one of two desperate steps, to desert their farms for other places or to join the rank of bandits or Communists. Everywhere the villages have been witnessing a silent but continuous exodus. Everywhere honest and peaceful peasants go " bad," or Red.

The 30,000,000 of Chinese in Manchuria did not go there because of inducements but rather because of despair. The Marine Department of the Japanese Kuantung Government recently reports that in the first nine months last year 232,098 Chinese went into Manchuria through Dairen alone. This is an increase of 56,000 in comparison with the figure for the same period in 1932 and surpassed the total number for 1931 by 8,000. These immigrants are by no means less patriotic than the rest of the Chinese. Probably they have shed many tears over their ancestral graves before their departure. But they have to go because they want to live just as much as anyone else does.

There are many who have gone to Siam, Annam, the South Seas, and other places, untold by statistics. Countless others pour into the cities to pull rickshaws, to work in factories, for rich urban families, or even to beg in the streets. Few return to their farms as did the lucky Wang Lung in " The Good Earth " which, unfortunately, is fiction. If anyone would like to get an idea of the size of the exodus, he need only spend a few minutes at a railway station, a canal jetty, a " mud-hut settlement " in the suburbs, or in front of an urban employment agency. Even walking in a busy street, one may frequently catch a glimpse of the tragic flight when a blue-clad " bumpkin " is caught in the midst of traffic, scared and helpless like a trapped beast. Nothing, in fact, could have induced him to leave his farm, home, and ancestral graves except the urge to live. He would never have left had conditions been tolerable for existence.

As to those who have become Communists, the popular understanding is that Soviet propaganda has led them astray. But, in reality, they are not persuaded by Moscow to worship Marx any more than their adventurous brothers are encouraged by the Japanese rule to colonize Manchuria. Like all agricultural people,

they are conservative in nature, not inclining to believe in anything inconsistent with convention. But while Marxist preachers cannot win them over by words, Chinese militarism have driven them Red by deeds. Take Szechuen again for instance, can the Communists there succeed without the local warlords who have compelled the people to grow poppy, to pay in advance land taxes due to their grandsons, and tortured them with wars and soldiers ? If anyone should expect the Chinese people to die under militarism rather than to turn Red, he certainly has too much confidence in their tolerance.

The War on the Reds

Communism, being a strange plant brought from a strange land, could not have grown on the homely soil of China. But, now it shoots up here and there, swelling into amazing size overnight. Who has prepared the land so well for its miraculous growth ? The Chinese militarists, it is true, hate Communism, kill its adherents, and suppress its literature. They shout to a credulous world, " We are wiping out the Reds for our people." Let us see how much they have " wiped out."

In " The World's Danger Zone," the author tells us that within one year of its establishment in Kiangsi, the Communists had increased their rifles from 1,000 to 30,000. The eight-month suppression campaign led by General Ho Ying-ching gave them 40,000 more. When General Chiang Kai-shek returned with his 250,000 model army after a " successful " wiping-out, the " subjugated " Reds found themselves in possession of more new rifles. The Communist leaders, we know, have been killed at least fifty times in newspaper columns but that does not prevent them from repeated resurrections. Probably they will die once more in the prevailing campaign.

Westerners cannot appreciate the Chinese theater performance because the actor killed on the stage rises up and runs to the exit right before the eyes of the spectators. But they do not seem to have grown tired of the similar comic-opera going on all the time on China's political stage. The heroes in this play, however, know too well what the climax will be and have prudently deposited their money in foreign banks and built their houses in the Settlements and their Adam's gardens in war-proof Switzerland. They have emptied the green room and the ticket office and, when they will have to quit, the theater will be empty and in ruins. What do they care whoever is going to run it after them ?

We need not say who are the real authors of the rural exodus and Sovietization. Nor do we need discuss the reasons for those peasants who have become bandits or joined the army. The urge to live may be expressed in different ways, but the motive is one and the same.

The Harm to Treaty Ports

These salient facts give us a general idea of the seriousness of the collapse of rural China. In reality, it is not a problem that affect China alone but one that involves all countries that have trade or other interest in her. The bankruptcy of 74.5 per cent of her population has kept down the purchasing capacity of the whole nation. According to the investigation of the Trade Bureau of the Ministry of Industry, the total imports of the first six months of 1933 have dropped 24.38 per cent, in comparison with those of the identical period in 1932, and that 55 per cent of China's total foreign trade is concentrated in Shanghai.

This shows two significant facts : (1) the purchasing capacity of China is rapidly declining, (2) the wealth of inland China has been pouring into the treaty ports. The cash in Shanghai banks up to July last year amounted to $275,480,000 and Tls. 140,792,000, surpassing those of 1932 by 10 per cent and of 1931 by ever more. In the first ten months of 1903, there were only two banks liquidated but 15 new ones sprang up like " bamboo-shoots after spring rain." Nevertheless, the price of all commodities has been going down since 1932 and " Great Reduction Sale " banners flew over the busy streets almost all the time. The foreigners and Chinese in the Settlements and Concessions expand their bank vaults and dream of eternal prosperity. But unless rural conditions see improvement, the depression will increase and eventually stifle also the treaty ports, of which Hankow is already an example. One never can expect a handful of rich Chinese in the cities alone to consume all the cargoes that the inbound ships may bring. It is, after all, the great masses of China which are the major purchasers.

In short, if the present state of affairs continues, the ruin of rural China may, at least for a short period, become irreparable. It would crush the three hundred and sixty million farmers, plunge the whole country into unprecedented chaos, and strangle its foreign trade.

In spite of such a pitiful outlook, the National Government so has been engrossed in the so-called Anti-Red Campaign that it hardly lifts a finger to prevent the downfall. The major portion of the national revenues continues to be spent on military expenditures. An editorial of the *Shanghai Morning Post* tells us that the budget of last year indicates revenues of $680,415,589 and expenditures of $829,921,964. The National Government, therefore, has faced an annual deficit of $148,506,375, or $12,375,500 every month. When we examine the budget closely, we find that the deficit is mainly caused by the swelling item of military expenditures.

In addition to the military expenditures, the amortization of debts, domestic and foreign, absorbs about 40 per cent of the national treasury. annually. The Peking Government during its rule of sixteen years, had issued domestic loans totalling $631,109,588. The Nanking régime has outdone its predecessor by issuing $1,072,000,000 of domestic loans, without counting the recent " State Lottery for the Promotion of Aviation and Highways," in a period half as long as the Peking administration. When the annual sinking fund for the amortization of these loans and foreign debts and the amount for " military establishment " are paid out, the Government will be left with a practically empty purse.

Since the proceeds of national loans, excepting a portion of foreign loans and the Boxer Indemnity, are mainly squandered on armaments and inter-factional conflicts, they should be deemed also as military expenditures. From 1928 to 1931, the two items combined constituted more than 80 per cent on the average, of the total Government disbursements, as indicated in the following :

	1928-1929	*1929-1930*	*1930-1931*
	%	%	%
Loans	36.8	40.4	39.5
Military expenditures ..	48.2	49.6	31.3
Combined	85.0	90.0	70.8

But why should China spend so much of her meagre revenues for military purposes ? For national defence ? She has lost 496,164 square miles of territory in less than two years ! For bandit suppression ? We find more "bandits" now than ever before ! For wiping out Communism ? The people have never been readier to turn Red than they are now ! We remember that in January, 1929, a Military Reorganization and Disbandment Conference was held in Nanking, promising the people to limit military expenditures to $192,000,000 annually. On that promise, the Government floated on the market Disbandment Bonds for fifty million and Demobilization Bonds for seventy million dollars. But the sad truth is that except the bonds, nothing materialized.

Hypothetical Cases

Last year, the item for military expenditures swallowed up half the Government's income, even in the face of the tense economic crisis. The technical excuse is " Communist Suppression." If the Anti-Red Campaign is carried out, what will be its results ? What good will it do to the country and the people ? Let us imagine the following hypothetical cases :

(1) Suppose that the campaign results in successfully recovering the Red regions. What will these regions become ? There will be war-torn cities, thoroughly pillaged villages, deserted farms, countless victims of war, a general devastation with pestilence on its heels and, after all, the discontent caused by reclaiming land after the Communist re-distribution. At the same time, the Government, having exhausted its resources in a campaign of such extensiveness, will be forced either to declare bankruptcy or to exact more money from the already bankrupt people. The people, driven desperate by new and intolerable economic burdens, will subsequently turn into bandits and Communists. Then, perhaps, another campaign will be needed.

(2) Suppose that the Campaign fails to rout the Communists. What is the use of spending so much money for it ? Indeed, from all indications and inferences, the Government is but wasting money and energy in the present campaign as it had been in previous ones. It is not likely that Communism can be wiped out by force

of arms because its strength is essentially an economic one. So long as there is a great number of the people facing death and distress, there will be Communism in China despite constant killing and incessant bombardment.

(3) Suppose that the Communists are wiped out completely. Will China then be no longer menaced by disintegration, civil strife, and economic difficulty ? Will the disputing factions and fighting warlords come together in a cordial and harmonious union and together devote their energy and attention to constructive activities ? Unfortunately, even before there is any commendable material success in the Anti-Red Campaign, a new flag has already flown over Fukien and a new inter-factional war has begun on the Chekiang border. The insurgent force, with an understanding with the Reds and a nationwide popularity for its Spartan resistance during the Japanese invasion of Shanghai, may not be so easily subjugated as the Government has declared. One thing is certain : the Government will find itself more impotent financially and in its Anti-Red adventure. Besides, if we survey the nation, we see potential insurgents everywhere. Will the Government " wipe out " each and every one of them ? With such an outlook, we are at a loss to see how China could find her way out of civil war and bankruptcy even in the absence of the Communists.

(4) Suppose that the Communists are merely driven out of their present strongholds. Will that mean the success of the Campaign ? In all probability, the Communists will come back after the evacuation of the Government troops and reoccupy their lost regions. The only way to keep them away, it seems, is to station permanently a huge army there. Can the Government afford to do it ? Can the people, hungry and threadbare, afford to pay for permanent guards of such a size ?

Deplorable Reality

These hypothetical cases seem rather discouraging, but they have all the naïveté of a truth. Real facts are even more disillusioning. Red regions reads :

> " The weeds are growing rank in the rice fields, homes lie in ruins, bleak and forlorn, village upon village is totally depopulated, here and there a family huddle together in a shack, facing the winter's cold and gradual starvation."

In a special message in the October 24 issue of the *Shun Pao*, we find even more deplorable reality. In the city of Lien Hua, the magistrate, executing orders of the Anti-Red Headquarters to build motor roads for military purposes, forced a " contribution " of one dollar per capita from the people. On the doors of houses whose owners had fled before the advance of the National army, were found notices such as :

> " This is the house of So and So, a distressed refugee. May the National Army spare it from tearing it down for work materials. With gratitude."

The correspondent further relates that when on his way to Chuchow by train, a certain " inspector " of the Ministry of Railways had his straw hat blown off when he leaned his head out of the window, perhaps for the purpose of " inspection." To recover his hat, the train had to run backward for more than twenty *li*. Every pedestrian along the way was seriously questioned, " Where is the inspector's hat ? " Thus the train arrived at its destination 45 minutes late.

From the above, it is readily seen how the civil and military authorities operate in the recovered regions and how much the people appreciate their good work in rescuing them from Communism.

At present, though the Government has mobilized its men and money for the campaign, a thorough suppression seems yet a hope as remote as the stars. " If the generals under Chiang Kai-shek," remarks a Hankow correspondent, " would bury their secret grudges and join forces in one united and simultaneous drive on all the Red strongholds, victory would be attainable." But this is exactly the thing they will not do ! We have no idea how long the campaign will last and what fruits it may yield. We know, though, that at present already the Government has incurred a financial crisis that foretells a military failure.

Pile of Dead Promises

Every time when there is a civil conflict, the people are told that it is " a war to end war " and one for the benefit and unification of the country. Every time a tax is levied or a loan floated, it is understood to be used for bandit suppression or other good and constructive undertakings. The wars have been fought and the money pocketed. There remained only a pile of dead promises. In a recent book, " Far Eastern Front," Edgar Snow aptly observes :

> " Day after day, month after month, over the newspaper desk of China, pour an unending tale of words beginning with " dis." Dispute, disorder, disunity, disloyalty, dishonesty, dispiritment, disorganization, dissolution, disturbance—distress ! The same evils remain : flood, famine, civil war, opium, injustice, illiteracy, brigandage, militarism, oppression of peasants, starvation, bribery, nepotism, and so on. Over a period of years names change, government change, program change, but the main performance runs on. The same evil rôles persist, the essential characters seem timeless, lacking in meaning, coherence, and scientific purpose."

All these evils need be got rid of, but none urgently than the root, militarism. Yet, the people have to water it with their sweat and blood. It continues to grow and absorbs the nourishment needed for China's national existence.

It is not our purpose here to discredit the Government, nor to ridicule its policies. We merely endeavor to analyze the situation of China in the light of science and common sense, with a view to calling the attention of the public to the real crisis of this country, the collapse of rural China. A sane government cannot be blind to its fundamental issue and will give its major energy and resources to it. The Roosevelt Government of America is devoting itself to the problem of national recovery, the Soviet Government to its Second Five Year Plan. There are certainly other important problems to be solved besides, but these governments have put the fundamental one above all others.

The Most Urgent Problem

That rural recovery is to-day the most urgent and important problem of China has been sufficiently proved above by solid facts and scientific data. But the Government seems to think the Communists a greater menace than the budgetary red-figure. What, to the people, is the difference between a government in the " red," and the Red in government ? Besides, the growth of Communism is chiefly a result of the collapse of rural China. Can the effect be removed without first destroying the cause ?

What the people want now is a breathing in peace. They need it for recuperating themselves. They are not enthusiastic for a fruitless Anti-Red Campaign which means nothing but more taxes, loans, exile, killing, and devastation. Twenty-two years of misgovernment have hardened them to accept anyone's rule, be it Communist, Japanese, or what not. They are disheartened and do not care. " Just let us take a breath " is all that they ask now.

Lately, we have heard much about conferences and committees for the purpose of rural recovery. It seems that the Government is in earnest to improve the critical situation. But the people have been so much " fed up " with empty promises in the past that they are naturally not inclined to believe until they see results. According to recent special correspondence in the *Peking World Daily News*, of the amount $2,188,343 already appropriated from the War-region Recovery Loan issued by the local government of Shanghai, only $50,000 were spent on reconstruction in the war-torn regions of this city, but an amount of $2,400,181.74 has been secretly and illegally remitted to the Anti-Red Headquarters ! If such is the inner truth of all " recovery " measures of the Government, the people would rather have none.

Real Good Wanted

Besides, a program for rural recovery should be based on the scientific investigation and recommendation of sympathetic experts. We doubt very much that one formed by the opinions of bankers, landlords, and their " experts," would be of much good to the tortured peasants. A reserve granary established on selfish principles may profit only some rice merchants' syndicate behind it. A rural credit bank may become a mere mint for a few capitalists.

In short, the people want only a program that will do them real good and not the private enterprise of opportunists with the word, "recovery," on their label.

We do not venture to suggest here a program for rural recovery because a lay opinion has no practical value. It is enough that we point out the vital importance of saving rural China from a fatal collapse and the imperative necessity of directing the Government's major resources to the task.

At the time of the Northern Expedition of the Kuomintang, it promised the people a good government based on Dr. Sun Yat-sen's Three People's Principles and Five Power Constitution. It brought the people the blooming hope of peace, order, consolidation and reconstruction. Seven years ago they had a hope, now they have a "rope." A review of the Government's activities in all these years, convince us that its promises could have been fulfilled but for inter-factional jealousy and the vain rivalries for establishing a military hegemony. Disputes, compromises, internecine wars and truces were the big items of each year. These consumed almost all the money and energy of the Government, creating circumstances which made constructive undertakings impossible. Having under its actual control the richest and most prosperous provinces of China and holding the key position of the great Yangtze, the Government might have brought about great progress within its jurisdiction. With her Five Year Plan, the Soviet Government of Russia succeeded in bringing her light industry to an increase of 170 per cent and her heavy industry to 321 per cent in sending 82 per cent of her children to schools, and in greatly strengthening her army and national defence.

The Government's Weakness

Why could not the Kuomintang Government do the same in seven years? Had there been a practical program and an efficient and honest administration, agriculture and industry could have been developed to a considerable extent in these provinces. That would strengthen the foundation of the Government, enrich the people, and eventually bring the rest of China under one unified rule, without difficulty. But, instead of implanting its root in constructive achievements and in the strength of the people, the Government has been hanging on the skirt of the Shanghai bankers. It has spun a thick cocoon of debt from which it finds no way out. For several years, outwardly it appeared silky and smooth, but inwardly it was an impotent and helpless chrysalis. Then, came the Yangtze flood, the Japanese invasion, and the financial crisis, exposing its weakness, naked and skinny!

In one word, the weakness of the Government lies in its total neglect of the vital problems of fundamental rural reconstruction. In its wild chase after birds in the bushes, it exhausts itself and strangles the one in its grip. There is now only one way, and perhaps the last opportunity, for the Government to survive. That is, to admit the present regional political and economic realities, cease worrying about saving its "face," and concentrate on saving the districts of rural China now under its control.

Japanese Sundry Goods Exports Hard Hit

By EISABURO KUSANO

VIGOROUS opposition is voiced by Japan's sundry goods exporters against the new Indo-Japanese commerce convention as it has dealt an unexpectedly severe blow to Japan's general merchandise trade with British India. The cry was raised as soon as the Government of India introduced the bill of "tentative" specific duties in the Indian Legislative Assembly on December 22, 1933, and subsequently the bill was put into force the following day. The sundry goods exporters' complaint notwithstanding, however, the Japanese delegation in New Delhi has virtually concluded the negotiations and the text of the new convention is being drafted to be initialed. It is in the face of this "alarming prospect" that the exporters in Japan, particularly those in and west of Nagoya, have launched an organized campaign to influence the Governments of India and Japan so that the new duties would be mitigated at the present session of the Indian Legislative Assembly.

At the time when the present Indo-Japanese trade negotiations were opened, the position of the sundry goods in the conference was vague. It was treated as a weak spot on the part of Japan in consideration of the fact that it had no "weapon" to restrict the Indians, as in the case of the cotton piece-goods, the Japanese producers of which could go without buying an enormous quantity of the Indian raw cotton.

It is understood to have been the primary policy of the Japanese delegation not to touch on the sundry goods issues if possible. Furthermore, in view of the fact that the cotton piece-goods trade with British India had fully developed while the trade in sundry goods had more room for expansion, the Japanese delegation, it is understood, was inclined to sacrifice to some extent Y.120,000,000 of cotton yarn and textile trade for the sake of the sundry goods trade which amounts to Y.80,000,000. As the negotiations developed hitches, a contrary outcome was brought forth, the Indians having taken full advantage of the situation, as was evidenced by the sundry goods tariff revision previous to the conclusion of the parley.

Dealers are Given Shock

The Japanese sundry goods exporters were prepared for some revision of the tariff from the outset of the present conference. But they expected that the increase would not be larger than the then prevailing rates by from 20 to 30 per cent, so long as such changes were designated to protect Indian home industry as was then announced. They expected also that the number of items to be affected by such tariff revision would be more or less limited.

When the new duties were made known, however, the rates were by far higher than had been anticipated, and a considerably large number of items were affected.

Out of 21 kinds of Japanese miscellaneous goods affected by the new specific duties, pottery and ceramic wares, knitted goods and hosiery, enamelled ware, toilet and laundry soap, and pencils were particularly hard hit as is illustrated in a list to follow in which the new rates, converted into those of *ad valorem*, are compared with the old (The list was submitted to the conference of sundry goods exporters in the early part of January, 1934; it was attended by more than 30 delegates of Osaka, Kobe, Kyoto and Nagoya, representing the traders particularly hard hit).

Articles	*New rates*	*Old rates*
Pottery, ceramic ware	325 %	30 %
Knitted goods, hosiery	220	25
Enamelled ware	120	25
Toilet soap	135	35
Laundry soap	95	25
Pencils	200	25

These new specific duties are highly effective in restricting the import into India of Japanese merchandise. For instance:

Up to 80 per cent of the knitted goods exported from Japan to India are those which are priced between 80 sen and Y.2.50 per dozen, and these are used by Indian natives whose standard of living is extremely low. The levying of a specific duty which comes up to more than 200 per cent when converted into that of *ad valorem* on these cheap goods is prohibitive. And the excuse that the measure was taken to protect the Indian home industry is weak because India's domestic production is hardly sufficient to cover 10 per cent of the entire demand in that country.

As regards pottery, ceramic wares and enamelled ware, these industries are non-existent in India except that a small quantity of elementary grade is supplied by some local enterprisers. And yet such prohibitive rates are levied.

The Japanese sundry goods exporters, seriously affected by these new specific duties, were puzzled. They thought that the new duties were worked out either due to the lack of knowledge on the part of Sir Joseph Bhore or in order to restrict the Japanese cotton people to expedite the conference.

Other Disclosures

Further investigations revealed, however, that the market price of the British ceramic ware in the Indian market corresponds to that of the Japanese after the new duty is added. The Japanese have also found that a certain Indian nobleman was running a small pencil factory. These facts and other discoveries have convinced the Japanese sundry goods exporters that the levying of these prohibitive duties was more deep rooted than they appeared to be at the beginning.

The outstanding significance of the present trade barrier in India is that the Japanese factories engaged in the production of goods exported to India are mostly run on small domestic scale. As the result, the suspension of trade has a direct bearing upon the welfare of these small interests and more on the employees thereof. In point of fact there are indications of many factories being forced to close down or go bankrupt unless a way is found out of the present difficulties.

The Indian specific duties, which were "tentatively" levied on the Japanese goods to protect the British industry and also to help a limited number of manufacturers in India, have not only deprived 400,000,000 natives of India of low priced Japanese goods, but have also thus given rise to a social problem in Japan.

Japan's sundry goods export trade with British India amounting to Y.80,000,000 a year is made up of knitted goods, hosiery, glass ware, pottery, ceramic ware, cast iron manufactures, personal ornaments, lumber, toys, cement, paper, camphor, lamps, machinery and parts thereof, hats, caps, beer, cotton towels, buttons, woollen goods, silk handkerchiefs, umbrellas, brushes, soap, matches, oils and so on.

And the prospects of trade with India in these goods are decidedly pessimistic in view of the likelihood that more goods, which passed through the present straining of the tariff sieve, will be caught in the near future. And such is not altogether out of possibility judging from the fact that Sir Joseph Bhore, on January 26, 1934, revealed suddenly that the Government of India had a plan to increase the duty on Nippon rayon. Japan was shocked as rayon was excluded from the topics of the present negotiations and as it was considered that all the questions at issue concerning rayon had been settled.

Delegates Under Fire

It appears that the Japanese Government delegation to India is not above criticism. In the present negotiations, cotton piece-goods and Indian raw cotton were the principal subjects of discussion from the beginning to the end. And it still remains to be seen how the negotiations now pending on sundry goods may develop. It is reported, however, that the Japanese Foreign and Commerce authorities, when the Indians proposed to change the *ad valorem* duties into specific duties had no definite idea as to how the change would affect the Japanese trade, except the assurance on the part of the Indian delegates that they would not impose "unreasonable" duties. The Japanese delegates were not businessmen enough to make any definite arrangement as regards how the change should be made, that is, what should be maximum rate applicable to the Japanese sundry goods, in spite of the caution and suggestions offered by the Japanese sundry trade people. And the same sin of non-commitment has brought forth the proposed levying of additional duties on rayon of which the trade with India has already been affected by the recent levying of heavy duties.

Japanese Protest

In the face of the nationwide campaign of sundry goods exporters against the forthcoming Indo-Japanese commerce convention, in which all the influential trade organizations affected are acting hand in hand, and which is supported by the cotton people, the Japanese Government instructed Minister Setsuzo Sawada, head of the Japanese delegation now in New Delhi, to make a strong representation to the Government of India, on January 14. Minister Sawada, consequently, called on Sir Joseph Bhore on January 22 to call his attention to the prohibitively high rates against the Japanese merchandise contained in the new Indian tariff schedules put into effect by Executive order of December 23, 1933. He buttressed his remarks with detailed figures contained in a 34 page *aide-mémoire*, which came under separate headings, which, in substance, was as follows:—

After assuring the Indian Government that the Japanese Government had no intention to interfere with the protective tariff policy adopted by the Government of India, the document pointed out that the Indian industries at their present stage are not in position to supply the population of India with its sundry needs. Consequently, the Japanese paper stated that the importation of Japanese goods was for the benefit of the Indian masses who required cheap goods. The document then went on to declare that the specific duty schedules were unfair and that no discrimination was provided with regard to weight, size, or quality. It requested that the schedule be changed, if it had to be applied at all, so that these additional factors be included in its provisions.

Extensive figures were provided showing that the new specific duties corresponded to from 60 to 370 per cent increase, if the levy was collected *ad valorem*.

While the purpose of the new levy was apparently aimed at lifting market prices of Japanese imports into India to the level prevailing before Japan went off the gold standard, the *aide-mémoire* stated, the tariff far exceeds this. It pointed out that the Indian price indexes showed a drop of from 15 to 30 per cent if compared with those effective in the period previous to Japan's departure from the gold standard.

Charge Bad Faith

In conclusion the *aide-mémoire* referred to the fact that the Japanese delegation had agreed to a number of concessions in the conclusion of the new Indo-Japanese trade convention with the tacit understanding that India would not lift her tariffs on sundry goods. The document pointed out that as the result of the agreement reached recently providing for a technical barter of Indian raw cotton against the Japanese cotton products, India was benefitting by a large trade balance in her favor in so far as the Indo-Japanese trade was concerned. Japan, the document stated, aimed as filling the gap created in its export to India by the restriction of cotton goods export by, at least, maintaining the amount of the India bound export in sundry goods to the figure prevailing before the new tariff went into effect.

To supplement the foregoing written statement, Minister Sawada is reported to have said, during the interview with Sir Joseph, that the new tariff schedule was a violation of the pledge which the Indian delegation of the textile conference is reported to have made earlier in the negotiations, and that it has caused the abrogation of various contracts and has brought about the virtual collapse of many Japanese firms engaged in the India trading in the articles subject to new tariff.

The Japanese delegate, moreover, is understood to have said that the effect of this new tariff schedule, at a time when a new Indo-Japanese commercial convention was about to be initialled after three months of discussions, it is feared in Japan, will be bad not only in respect of Indo-Japanese trade but also upon the relations between the countries in general.

It is reported that Sir Joseph promised Minister Sawada to present the Japanese Government's view to the special committee that will discuss the new tariff bill which includes the high tariff measure when it will be presented to Parliament for discussion.

What will result from such a promise of Sir Joseph, however, remains to be seen. The scribe is one with the pessimists who fear that the situation can hardly be improved.

Leaders Hold Parley

According to a report from Minister Setsuzo Sawada received by the Foreign Office, Tokyo, on February 12, Sir Joseph Bhore, in the course of their interview on February 10, declared that he did not consider the new sundry goods and textile duties as unreasonable.

Minister Sawada called on Sir Joseph on February 10, and they had a lengthy conversation concerning the Indian textile

industry protection bill which was introduced in the Indian Legislative Assembly on February 5, and also as regards the sundry goods issues.

The Japanese envoy pointed out that the textile bill signified an increase of duties on the Japanese silk and rayon goods to a prohibitive extent, and that it was highly detrimental to the trade. He then requested the Indian chief delegate to exercise his influence to prevent the passage by the Assembly of the sundry goods duties bill. He furthermore requested the exemption of duties on sundry goods of which the import into India was contracted previous to the promulgation in December, last year, of the "tentative" duties now in practice.

Sir Joseph replied that the duties in question were considerably lower than originally recommended by the Indian manufacturers of the articles affected by Japanese competition and also by the Indian tariff investigation commission. He said that the Government of India on adopting these rates had fully considered the "information" given by the Japanese Government in protest as well as the desires expressed by the Japanese exporters besides the interest of the Indian consumers. Sir Joseph explained in detail each article listed in the tariff bill announcing that he did not consider them as unreasonable. Moreover, he laid stress on the point that the Government of India was in urgent necessity of protecting domestic industries.

Minister Sawada ended the interview by requesting Sir Joseph again to reconsider what the Government of India proposed to do. In the meantime in Japan, the opposition campaign has been carried on persistently.

The Japan Chamber of Commerce and Industry, with which all the commerce and industry chambers in this country are affiliated, has sent a severe recommendation to the Foreign and the Commerce Offices as the result of its executive committee meeting held on February 21. It advocated that the Japanese Government should file the "strongest protest" with the Government of India as regards the levying of high duties and that it should refrain from signing the Indo-Japanese convention of commerce unless the Government of India reconsidered the unfriendly steps it had taken under the excuse of protecting domestic industries. In substance, the recommendation read :—

"The Government of India, ignoring the spirit of mutual concessions and friendship, by virtue of which the new commerce convention has been concluded, has increased the customs duties on an extensive list of Japanese sundry goods. Furthermore, it is about to impose prohibitive duties on silk and rayon goods and also on more sundry goods which were not considered at the time of the recent tariff revision.

"Such a measure as now contemplated by the Government of India destroys the spirit of the Indo-Japanese trade negotiations. Japan alone must suffer from disadvantageous treatment as the result, and we are unable to remain silent in the face of such prospects.

"We hope that the Japanese Government will file the strongest protest with the Government of India and endeavor to make the protest good. We are of the opinion, furthermore, that in case the situation is not improved in spite of such a protest, it can not be helped if the Japanese delegate refrains from signing the new convention."

Public sentiment in Japan is that the Government of India has brought forth the conclusion of the trade negotiations by making superficial concessions in appearance simply in order to induce Japan to resume the purchase of Indian raw cotton. Because of the fact that the most favored nation treatment is recognized (in principle), that the customs duties on cotton goods were reduced to 50 per cent, and that what was called the anti-dumping law was virtually withdrawn, the present conference gave an impression as though it was a success on the part of Japan where appearance is concerned. The contents of the convention thus concluded, nevertheless, were far from satisfactory, especially as was proved by later Indian tariff manipulations. It is substantially advantageous for British India.

Extra-Territoriality—Two Viewpoints

Two articles devoted to the vexed question of extra-territorial privilege that most foreigners have in China, which have been published in recent issues of the "China Critic," present points of special interest for those concerned with Chinese affairs. The viewpoint of the foreigner on this question is given by Mrs. Grace Gould, an American newspaper woman of exceptional ability, who formerly was a member of the editorial staff of the Shanghai "China Press." She approaches the question from the standpoint of a foreign mother and in simple lucid phrasing she explains precisely why the alien in China is reluctant to surrender himself to the mercies of a Chinese jurisdiction. The Chinese attitude in the matter is set forth most ably, and in characteristic Chinese fashion, by Mr. Lowe Chuan-Hua, Secretary of the Chinese Y.M.C.A., and a publicist who has won some measure of prominence by reason of his ultra-Liberal, not to say leftist, political views. The two articles are reprinted in the following.

* * *

Whose Move Is It?

By GRACE GOULD

WOMEN, they tell us, are the basic conservatives, and probably it's true. It might be more accurate to say that mothers are. Plenty of young, intelligent, eager women grow up as liberal, as radical as their brothers, may be more so ; but with the founding of a family, the woman, even more than the man, begins to play safe.

Thus, in principle I believe that extra-territoriality and foreign concessions should be abolished. China should belong to the Chinese. Foreigners should be treated like foreigners anywhere else. They should conform to Chinese law, or else get out. It all reads well.

But just the same, if my little boy grows up in Shanghai, and drives a car, and some day hits one of those shut-your-eyes-and-run-for-it pedestrians whom it is an hourly miracle to miss, I'll feel safer if the policeman who takes him in charge belongs to an International Settlement, and if I know he's going before a Judge Purdy.

And while my children are small, I feel safer to know that the dairy their milk comes from and the markets their meat and vegetables come from, are inspected by foreign officials. I feel safer that the accumulation of spittle, sometimes blood-stained, through which they must walk if they go out on Shanghai streets, is at least cleared away periodically under foreign authority.

I felt safer in 1932 that my little girl (there was only one then) was well inside the barbed wire of Frenchtown ; when I went out to help "cover" the war, I was glad that soldiers and volunteers from France and Britain and America and the rest were watching the gaps in that barbed wire ; I was glad that I could be sure Japan would feel it unwise to bomb the schools and homes and hospitals inside that guard.

Observing the upward graph of customs duties on infant foods and shoes and woolly leggings, I am glad that at least some of our taxes are under foreign supervision ; for when family financing is budgeted toward the schooling of children and necessary voyagings across the world, you would hate to pay over the money for next year's new clothes to help finance some general's campaign in some province or other, and then contribute the rent to that defeated general's successor, and the food budget to the general after that, perhaps in the form of theoretical taxes for the year after next.

Now I am not unaware of the selfishness of all this. There are two main lines not entirely consistent with each other, which one constantly hears in the arguments against extra-territoriality :

(1) You would be just as well off under Chinese rule, and
(2) Why should you be any better off in China than the Chinese ?

To the first there is the footnote that even if you wouldn't be just as well off instantly, you must give the Chinese government a chance to grow, and then you will be. From the second there

dangles the old retort, good anywhere, supposed to crush utterly any foreigner who dares to criticize the country in which he is an alien :

" If you don't like it, you can go home."

I take it that most English-speaking Chinese are realists enough to know that, for the present at least, the foreigners in their midst would *not* feel themselves as well off under Chinese rule. It isn't merely that the Chinese government is in an unsettled state of change, and that we don't want to be involved in China's wars and the costs thereof ; it is also that we are just plain different. Our concepts of justice, our concepts of sanitation are different. Quite frankly, we like our own better. We don't want to change to yours. We are by no means sure that you want to change to ours (Why should you ?), or that, in such matters of western specialization as you do want to, you *can't* do it, in a country of four or five hundred millions, overnight. Since we have extra-territoriality at the moment, we'd rather you'd show us first, please, before we give it up.

The answer to that, I know, is that you can't show us till we do give it up. And there is an impasse.

We are not entirely unaware of the Chinese side of the thing. Plenty of us suffered in 1932 in the knowledge that the enemies of China were in a position to use the Settlement as a base, and marveled at the restraint of the Chinese who refrained from any attempt to take it out on us. But just the same, while we know that to abolish extra-territoriality and foreign concessions would give China a freer hand in some respect, we know that it would give her possible enemies a freer hand in other respects—and those respects might bomb *our* houses. As with war, so with other matters ; we feel, the rank and file of us foreigners, that there is scope enough outside the few miles and the few courts that foreigners control for China to show us, in the welfare of her own people, that she can take care of us too in the style to which we are accustomed. We want to be shown.

So we are left, in our frank selfishness, to face the second line of argument : why should we have these special privileges ? If we are better off than the people to whom the country belongs, why should we be ?

The answer, I am afraid, is that we *are*.

Why shouldn't we take what is good enough for the Chinese, or else go home ?

The answer is that we have something better.

It isn't quite as simple, or quite as crass, as that, of course. This something we have is not exactly, as patriotic students feel, something we have snatched from the Chinese. It is, in large measure, something we have made, or brought here—a foreign contribution to China, not merely a grabbing from her. It is as true as it is trite that Shanghai was a mud flat on which you dumped us to be rid of us, if you must have us somewhere. It is also true and also trite that Chinese citizens have found the place, and others like it, good, and have chosen them in preference to Chinese-governed cities till the foreign-controlled places draw largely on Chinese support. Well—whose fault is that ? As for the courts, there, too, a certain relief seems to have been sometimes manifest in turning over these strange barbarians to their own authorities to cope with them. The codes were so different. They still are ; where they have changed, has not the Western code made its contribution ?

It isn't quite as simple as if we were coming here for the first time to-day. Then you could make the rules (though even to-day there are cynics to whisper that he who would rule others must first rule himself, and that if he doesn't, somebody else will). In the old days the rules were different ; we hope they are better now, but what we have to live with is the results of the old rules—" a condition, not a theory."

We are here, we foreigners ; and here on a different basic assumption from that in countries to which foreigners have gone with no claim to special privilege. Our businesses, our family life, have been built up on that assumption. Without extra-territoriality, many of us would not have come ; certainly, much of the money which has financed Chinese as well as foreign developments would not have come. If extra-territoriality and foreign concessions were straightway abolished, many of us would go home ; perhaps that is what you want. If so, when you are strong enough, you will send us home ; but the paradox is that when you are strong enough for that, you will probably be strong enough so that we should feel safe to stay under no protection but yours.

In the meantime, during your long struggle, you would like us voluntarily to give up our special privileges, to share and share alike the fortunes of all who love China, or profit by her, enough to live here. It is a stirring ideal, and there are many among us foreigners who would like to embrace it eagerly, and make it come true. There are more of us than you will believe who would like to if we dared. But you will notice that most of those who are eager to count extra-territoriality well lost without demur are those without a stake in the country—without investments here, of money or of children growing up. Is it not even true that some Chinese with a heavy stake in Shanghai or in Tientsin look on foreign concessions with a tolerant eye ? Do they not suspect that, aside from their own pockets, China as a whole may lose something of stability if all foreign guarantees are done away with before China herself emerges from her present travail ?

But whatever the abolition of foreign privilege might mean to China, most foreigners here believe it would mean loss to us. This you must face. Governments at home may not always agree with us : diplomats might sign away our privileges ; but it would be over our protests until you can convince us that what you have for us, and for our children, is something just as good. We are no more perfect altruists than you are. We shall cling to what we believe we have helped to make until it is taken away from us, or *until we feel safe without it.*

We aren't wholly monstrous, either ; we should like all the Chinese peope to feel safe too, and we would help them if we knew how ; but we know that we do not know how, and that China must help herself. We do not believe that the sons of Chinese mothers brought before a Chinese court would be any surer of our idea of justice because our sons were there too ; we do not believe that Chinese children would be freer of infection if our children were deprived of foreign supervision over milk and water supply ; we do not believe that Chinese civil war would end in a sudden millenium the minute our sons and our resources came within its jurisdiction.

In a word, we believe we should lose something if we gave up our privileges now, and we do not believe that our loss would be your gain. Even if we did, we should probably, being human, cling to what we have until we are convinced—I have said this before—that we and our children are safe without it. Once we are so convinced, once we feel that a foreign investor, a foreign family can come here as we westerners go to each other's countries, and feel *safe*, extra-territoriality becomes just a nuisance we should be glad to be rid of.

But some of the foreigners to whom you point as getting along very nicely without special privilege come to us and say quietly, " We get along, we others, in the shadow of your extra-territoriality." So we are afraid. The times are insecure. Nobody wants to take unnecessary chances. You say to us :

" Give us full sovereignty, and we will show you what we can do."

But we say to you, we cautious mothers and fathers with children to support, and to protect :

" Show us what you can do, and we will give you your sovereignty."

* * *

Speaking of Extra-territoriality

By LOWE CHUAN-HUA

" You may someday find it necessary to quarrel *about* women, but never quarrel *with* them," said a philosophical friend of mine shortly before I was married. Since then, I have found this advice of immense practical value. And surely I wouldn't like breaking it just for the sake of a controversy on that uninteresting and almost too academic subject, extra-territoriality. I would, for instance, prefer to discuss children since Mrs. Gould, as her article shows, feels deeply concerned about them and has apparently arrived at the same point of parenthood as I have. I would find it much more enjoyable to offer her a couple of ingenious suggestions on how to keep the children immune from infectious spittle than to write about the abolition of extra-territorial privileges, concerning which I hate to take up in too serious a fashion.

But Mrs. Gould's viewpoint on the extra-territoriality issue is so honest and sincere, and her arguments are couched in such friendly terms that a few supplementary paragraphs, I hope, will

not be regarded as amiss. Indeed, if only the diplomats should talk in such plain language as she employs, how much simpler Sino-foreign problems would become!

Mrs. Gould believes that in principle extra-territoriality and foreign concessions should be abolished, but since under the present circumstances we are dealing with an actual condition rather than a theory, she concludes that the Chinese government must first show what it can do before the foreigners will become willing to relinquish extra-territoriality. She says, *inter alia*: "Our concepts of justice, our concepts of sanitation are different. Quite frankly we like our own better. We don't want to change to yours. Since we have extra-territoriality at the moment, we shall cling to it until it is taken away from us or *until we feel safe without it*."

Mrs. Gould admits that this is a selfish viewpoint, and we admire her courage in saying so. We venture to add, however, that it is somewhat like an imperialistic viewpoint. Isn't it the same thesis upon the foundation of which the foreign Powers have built up their colonial empires? Isn't it the same thesis which is repeatedly used to justify the exploitation of the backward countries by the more advanced? And isn't it the same viewpoint which is responsible for the manufacturing of various high-handed, though often high-sounding, devices which keep the natives of a land in continuous subjugation while the foreigners live a life of comparative ease and freedom? As long as the majority of foreigners in China harbor such an outlook as Mrs. Gould so ably describes, they are not to be expected to voluntarily give up their special privileges.

It must be recalled that prior to the advent of the Western powers, China was accustomed to make concession of extra-territorial jurisdiction to her neighboring states (particularly Russia, Japan and Korea) on a *reciprocal* basis. It was only after China had been defeated in the first Opium War that extra-territorial privileges began to be granted unilaterally. Thus the proposition may be ventured that it was not so much their superiority in the administration of justice (though this served as a good talking point!) as their military prowess that won the foreigners exemption from the Chinese laws. For many years Japan, too, had to tolerate the extra-territorial system; she finally got rid of it not so much because she had made progress in the practice of law and justice (though progress there was indeed) as because she had successfully demonstrated her ability to apply such weapons of warfare as the West understands.

The advantages of the extra-territorial system to those enjoying it are quite evident and are well summarized in Mrs. Gould's article. But the disadvantages to the Chinese are no less glaring, though Mrs. Gould doubts if the foreigners' gain means our loss. By virtue of this anomalous system, the Chinese government has not only lost control over the foreigners but has found it extremely difficult, and often impossible, to protect its own citizens. Extra-territoriality, for instance (and these are not at all exceptional cases), makes it possible for hundreds of Japanese to engage in opium-smuggling along the Kiaochow-Tsinan railway without any fear of being interfered with by the Chinese authorities; extra-territoriality enables Chinese gang leaders to form well-named companies for various mercenary pursuits under foreign protection; extra-territoriality enables the same kind of characters to kidnap well-to-do Chinese (whose safety in the International Settlement Mrs. Gould does not omit to emphasize) without much likelihood of being ever summarily dealt with; extra-territoriality makes it possible for a foreign adventurer to run a monthly in Shanghai for the primary object of slinging mud at the Chinese people without any danger of being beaten up or lynched; extra-territoriality means that a foreign motorist can run over and kill a Chinese peasant on the Shanghai-Hangchow highway and get out of his predicament at a sacrifice of only $20.00; extra-territoriality means that for several weeks early in 1932 thousands of Chinese families had to move out of Hongkew and leave what they had at the mercy of Japanese bombing planes in spite of the fact that these residents were the main contributors to the Shanghai Municipal Council's budget; extra-territoriality makes it possible for an oil swindler to successfully evade the clutches of American law and land in Shanghai to further defraud innocent Chinese investors; extra-territoriality means that Chinese policy holders find it much cheaper to give up their claims for indemnity than to fight against foreign insurance agencies to the end; extra-territoriality makes it possible for four foreigners to rape a Chinese woman in Chapei without arousing even the least reprehension in the local foreign press; extra-territoriality enables foreign-owned mills to employ Chinese women and children for working twelve to thirteen hours a day at ridiculously low wages and yet prevent these same toilers from organizing any attempt at improvement; extra-territoriality, in short, has inflicted untold suffering upon the Chinese people and has helped the foreigners in conducting outrageous activities in defiance of their own laws as well as the sovereign rights of China.

We realize, of course, that we are facing "a condition, not a theory," and we are not such empty-minded optimists as to believe that the foreigners in China will give up extra-territoriality just for the sake of altruism. But we doubt if it is going to be solved or ended in the way which Mrs. Gould demands to see.

First, there are those who would rather wait, and wait to see extra-territoriality die of its own accord. It has already outlived its effectiveness, they say. Sooner or later the foreigners will begin to see that, with or without extra-territoriality, they must learn to get along in China just as they do in the Western countries or as the Germans and Russians do in this very land. When that day comes, the foreigners will naturally give up extra-territoriality and perhaps even make a timely present of it to the Chinese government just like what the British did with Weihaiwei or what the Japanese did with Shanhaikwan!

Then there are those who would like to regard extra-territoriality as a small issue as compared with, say, the suppression of Chinese communists and political dissenters. The present authorities, it is said, may have good reasons to deal with extra-torritoriality in a protracted manner. Indeed, it would not be the first time in China's diplomatic history if expediency should win. The men who have been shaping the destiny of China in recent years have already learned the two Latin words, *modus vivendi*. Therefore it is quite conceivable that the Nanking Government, which is (in the words of Mr. Eugene Chen) committed to a policy of political Buddhism, will try to accommodate the foreign Powers and let the extra-territorial system go on for another decade. And Mrs. Gould's children will have no problem of security for at least ten years to come!

But there is a third group who are inclined to look at extra-territoriality a bit realistically, and who have reasons to fear that the foreigners will never give it up "until it is taken away" from them. And mind you, the termination of extra-territoriality in such an unpleasant manner is not altogether an improbability, however remote it may appear to us to-day. Before the World War it was universally acknowledged that the Westerner's ruling position in the Far East was incontestable. But events since the catastrophe of 1914 have entirely exploded this myth. Turkey has already cast off the shackles of Western imperialism. The Kuomintang, too, once showed what revolutionary possibilities it could attain when it had the backing of enlightened and organized masses. And the Wuhan Government regained two ex-British concessions around 1927 not so much by first showing that it knew how to run a "model settlement" as by threatening the use of organized revolutionary action. Do we wish to wait until the Chinese resort to this same weapon in abolishing extra-territoriality or have we become rational and far-sighted enough to remove Sino-foreign frictions in a peaceful way before our popular sentiments become impossible to harness?

Telephone Cable for China

An interesting order for telephone cables was recently completed by British Insulated Cables Limited, for Chinese Government use. Sixteen miles of 100-pair twin cable and the same length of 50-pair containing screened circuits were supplied. The cables were sheathed with 0.85 per cent antimony-lead alloy and armored with double steel tape. An unusual feature was the provision of compounded braiding over the armor and beneath the jute serving, which of course necessitated all the cables going through the braiding shops. In spite of this additional process the contract was completed within the specified time of eight weeks. In order to comply with the specification, which called for the same capacity for the screened and unscreened pairs, a whipping of paper string was applied to the conductors of the screened pairs in addition to the usual spiral paper insulation.—*Mechanical World.*

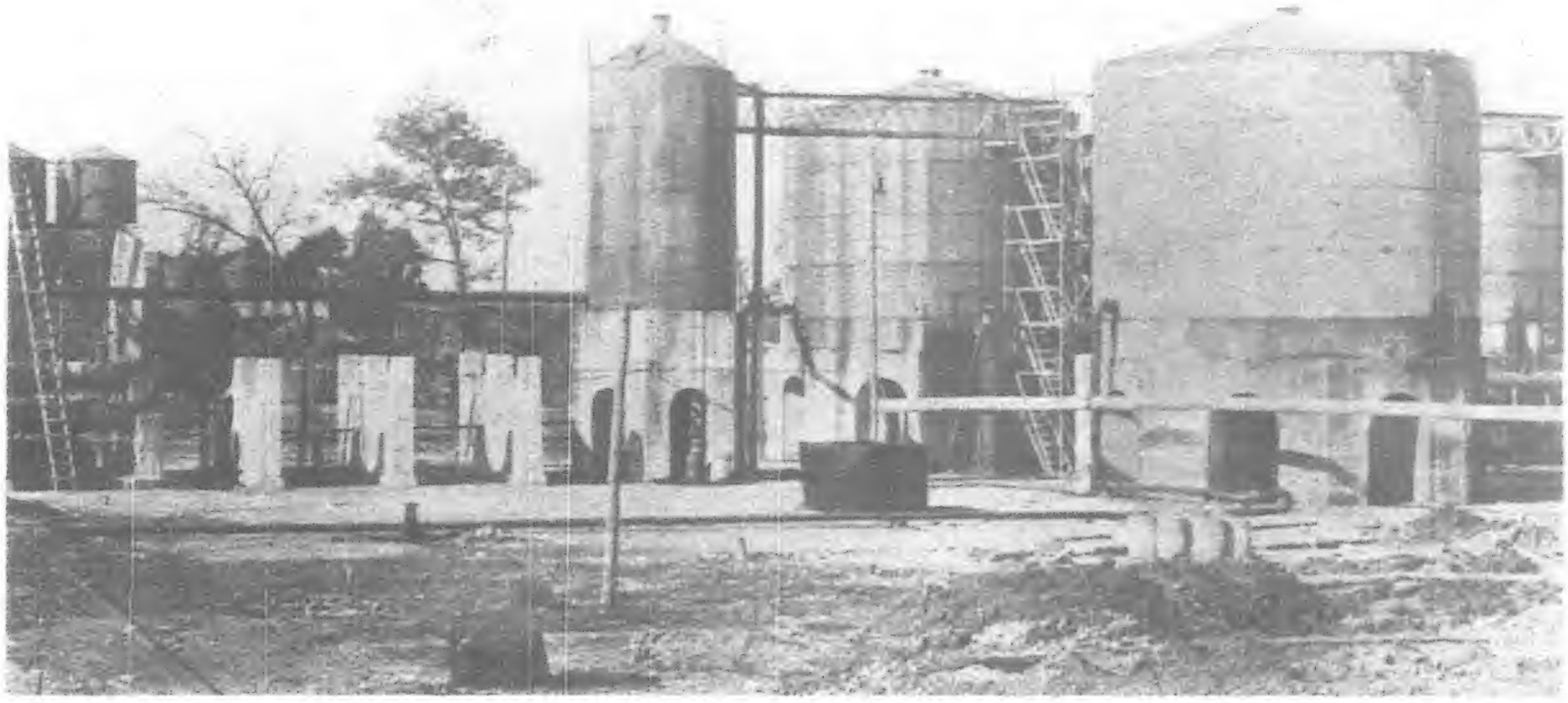
The Soviet Second Five-Year Plan of Economic Development*

(Theses of Report by V. M. MOLOTOV, Chairman of Council of People's Commissars, and V. V. KUIBYSHEV, Chairman of State Planning Commission)

During the period of the first Five-Year Plan there was built up in the U.S.S.R. a large-scale, technically advanced industry, especially outstanding successes being attained in the creation of an up-to-date heavy industry, the material basis of socialism, the foundation for the reconstruction of the entire national economy and a prerequisite for the more rapid development of the light and food industries and agriculture. Dozens of new branches of production were newly organized: the manufacture of complicated machine-tools, the automobile and tractor industry, the manufacture of combines, airplanes and airplane motors, the production of powerful turbines and generators, of special steels, ferro-alloys, aluminum, a modern chemical industry, the manufacture of synthetic rubber, nitric acid, artificial fiber, etc. Many industries were reconstructed on the basis of modern technique: knit-goods, clothing, shoes, meat, canned goods, paper, etc. Thousands of up-to-date enterprises, comparable to the best models of capitalist technique, were constructed, raising the entire national economy to a high technical level.

Victories in the development of industry made possible tremendous successes with respect to the transformation of agriculture on the basis of machine technique. The U.S.S.R. has become a country of the largest-scale agriculture in the world.

The marked successes in the creation of a new socialist labor discipline and in the acquisition of increased skill by the workers and the singificant achievements in the organization of production made possible the attainment, in the process of technical reconstruction of great victories in the matter of raising the productivity of labor. As regards the rate of increase in labor productivity, the U.S.S.R. has surpassed all capitalist countries, even when the peak prosperity years are taken for comparison.



A view of the Oil Refineries at Batum

The proletariat, overcoming enormous difficulties arising during the execution of the Five-Year Plan, achieved victories of historic significance in the matter of improving the welfare of the toilers of town and village. The superiority of the Soviet system has already in its present stage made possible the complete liquidation of unemployment, the introduction of the seven hour working day, the eradication of impoverishment and pauperism in the village. The worker and the collective farmer have acquired full security for the future, and the raising of their material and cultural well-being to ever higher levels depends solely on the quality and quantity of their labor.

During the years of the first Five-Year Plan the U.S.S.R. was converted into a country of advanced culture. The illiteracy of tens of millions of workers and peasants was liquidated, and the transition to universal compulsory elementary education achieved. Extra-mural education was extensively developed; the circulation of newspapers, magazines and other publications recorded marked growth. Considerable successes were achieved in the development of scientific-technical research.

Particularly noteworthy has been the economic and cultural progress which has taken place in the regions inhabited by the national minorities, which have rapidly advanced on the road toward complete liquidation of their backwardness.

As a result of the first Five-Year Plan the hundreds of millions of toilers throughout the world have for the first time in the history of mankind had proof in deeds of the possibility of building socialism in one country.

All these successes of the first Five-Year Plan have constituted the prerequisite and firm foundation for the development and fulfilment of the second Five-Year Plan.

The basic and decisive economic task of the second Five-Year Plan is the completion of the reconstruction of the entire national economy. The chief prerequisite for this is the mastery of the new technique and of the manufacture of new products.

Completion of Technical Reconstruction of National Economy and Program for Increase in Production

Production for all industry in 1937, the final year of the second Five-Year Plan, is set at 92.7 billion roubles (in 1926-27 prices), as compared with 43 billion roubles in 1932, the final year of the first Five-Year Plan. This means that industrial output in 1937 is to be 2.2 times that in 1932 and approximately eight times the pre-war figure. As regards production of consumers' goods, a more rapid rate of development is set, not only in comparison with the first Five-Year Plan but also in comparison with the rate of development of producers' goods in the second Five-Year Plan (an average annual increase of 18.5 per cent, as against 17 per cent in the first Five-Year Plan and an average annual increase for producers' goods of 14.5 per cent).

The following schedules for production are set in the most important branches of industry:

	Program for 1937	*Ratio of 1937 to 1932*
I. *Producers' Goods:*		
1. Machine-building (bill. roubles, 1926-7 prices)	21	227
Machine-tools, metal-cutting (thous. units)	40	267
Tractors (thous. 15-h.p. units) ..	167	323
Combines (thous. units)	25	250
Locomotives, trunk-line (in conditional units of "E" and "SU" type)	2,900	350
Freight cars (thous. 2-axle units)	118	532
Automobiles (thous. units) ..	200	837

*Report as given herein from the *Economic Review* of the Soviet Union is slightly abridged, and a few changes in figures have been made in accordance with later decisions of the government.

		Program for 1937	*Ratio of 1937 to 1932*
I.	*Producers' Goods :*		
2.	Electric power, total (bill. kw.-h.	38	283
	Regional plants (Glavenergo) (bill. kw.-h.)	25	302
3.	Coal (mill. tons)	152	235
4.	Oil, with gas (mill. tons)	47	213
5.	Pig iron (mill. tons)	16	258
6.	Steel ingots (mill. tons)	17	293
7.	Rolled steel (mill. tons)	14	331
8.	Copper (thous. tons)	155	332
9.	Chemical industry (bill. roubles)	5.7	307
10.	Lumber, sawn (mill. cu. meters) ..	43	176
II.	*Consumers' Goods :*		
	(in value, bill. roubles, 1926-27 prices)		
1.	Commissariat for Light Industry	20.5	308
2.	Commissariat for Internal Supply	12.9	283
	Food Industry	11	306
3.	Commissariat for Heavy Industry	2.9	300
4.	Producers' co-operatives	6	310
5.	Procurements Commission of Council of People's Commissars (flour, grits, etc.)	2.5	250
6.	Production of consumers' goods by other economic organizations	8.6	181
	(in volume)		
	Cotton cloth, including marketable unbleached goods (million meters)	6,250	229.8
	Woollen cloth (mill. meters) ..	270	295.7
	Shoes, leather (mill. pr.) ..	205	250.3
	Glass (thous. tons)	1,033	260.6
	Soap (thous. tons)	1,300	363.9
	Meat (thous. tons)	1,250	287.4
	Fish catch (thous. tons)	1,900	142.5
	Butter (thous. tons)	180	276.5
	Canned goods (mill. cans) ..	2,400	335.2

In view of the fact that *local* industry can constitute an important supplementary source of supply, production of consumers goods by local industry during the second Five-Year Plan period is to be trebled. Local industry is to be strengthened by transferring to the jurisdiction of local administrative bodies a number of industrial enterprises formerly under all-Union or republican jurisdiction, and a considerable share of the profits of local industry is to be placed at the disposal of local central executive committees.

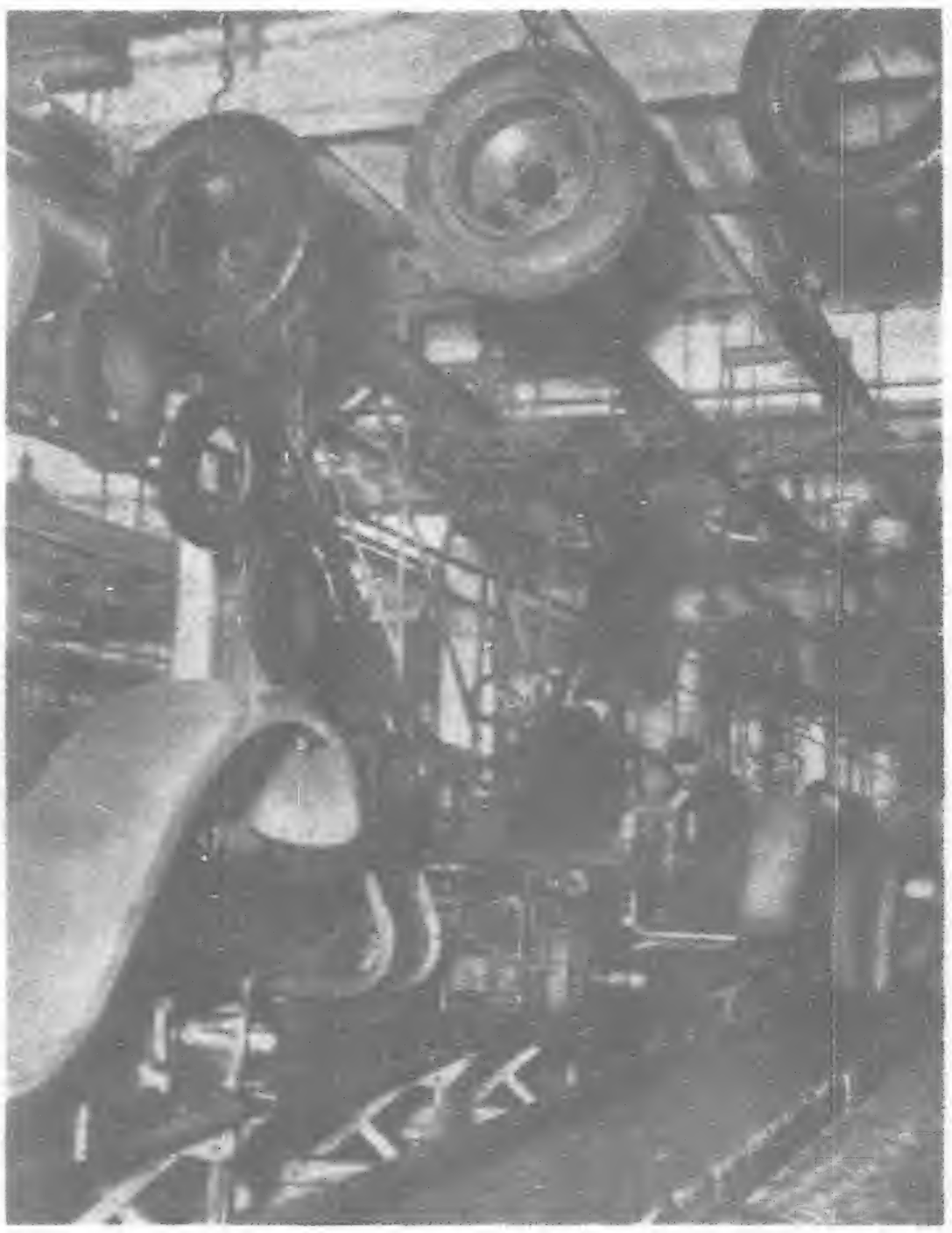
For the fulfilment of the scheduled program of industrial development and the consummation of the technical reconstruction of the national economy it is necessary :

(*a*) To carry out the technical *re-equipment* of all branches of the national economy of the U.S.S.R., involving the introduction in the shortest time possible of the latest technical achievements and the obtaining in 1937 of about 80 per cent of total industrial output from enterprises newly constructed or entirely reconstructed during the first and second Five-Year Plan periods. Means of production acquired by the national economy during the second Five-Year Plan alone are to constitute 50-60 per cent of all means of production in the entire national economy at the end of this period.

(*b*) To consummate a reconstruction of the *machine-building* industry, the leading branch of the national economy, which will insure the satisfaction, by its own forces, of all the needs of the national economy in modern, technically up-to-date equipment, such reconstruction to involve the extensive development of new types of production. During the second Five-Year Plan period the manufacture of some 200 different types of the newest machine-tools must be mastered. Machine-building for the metallurgical, light and food industries and for agriculture is of special importance in this field.

(*c*) To complete basically the *mechanization* of all labor-absorbing processes and heavy work in industry. In the coal industry the mechanization of cutting is to be increased to 93 per cent by the end of the five-year period, with a corresponding raising of the level of mechanization of other processes ; in the iron and steel industry 80 per cent of the total output of pig iron will be obtained from fully mechanized blast furnaces ; in the peat industry over 70 per cent of the total output is to be produced by mechanical methods ; in construction mechanization of the basic processes is to be increased to 80 per cent ; in the timber industry mechanization of hauling is to be increased six-fold and sawing into lengths and shaping three-fold.

(*d*) To create a new *power base* for the completion of the reconstruction of all branches of the national economy and to form in all power centers reserves of capacity adequate to insure an uninterrupted power supply for the national economy. To complete in the main the electrification of industry by means of the widest utilization of the newst electrical methods of production in all branches of industry, especially in metallurgy and chemistry (consumption of power by electrified production to increase to an amount nine times the present figure) ; extensive development of electrification of transportation and gradual introduction of electric power in the production processes of agriculture. To develop on a broad scale central heating for industry and large cities. To continue the policy of utilizing to an ever greater extent local fuel and especially hydro-electric resources for power supply. To complete during the second Five-Year Plan period the linking of regional stations into networks within district boundaries and to begin an inter-district linking of stations, including the erection during the five-year period of the largest power supply system in the world (Donbas-Dnieper), with an annual output of nine billion kw.-h.



Conveyor in the AMO Automobile Plant at Moscow

(*e*) To liquidate completely the lagging behind of the *iron and steel industry* with respect to the general rate of development of the national economy. To double during the five-year period the capacity of the steel mills and to overcome as rapidly as possible the gap between the capacity of the blast furnaces and that of the steel-foundry and, especially, rolling mill departments, which latter have lagged behind the former. To expand the production of various types of metal—special steels, electro-steel, ferro-alloys, complex rolled shapes, etc.—to a volume fully adequate to satisfy the needs of the national economy. To carry out an extensive reconstruction of the iron ore industry, introducing on a broad scale methods of concentration and agglomeration of ores.

To proceed at an especially rapid tempo with the development and technical re-equipment of *non-ferrous metallurgy ; to consummate* a complete transition to modern methods of copper extraction (flotation, reverberatory furnaces) and in the production of zinc to introduce

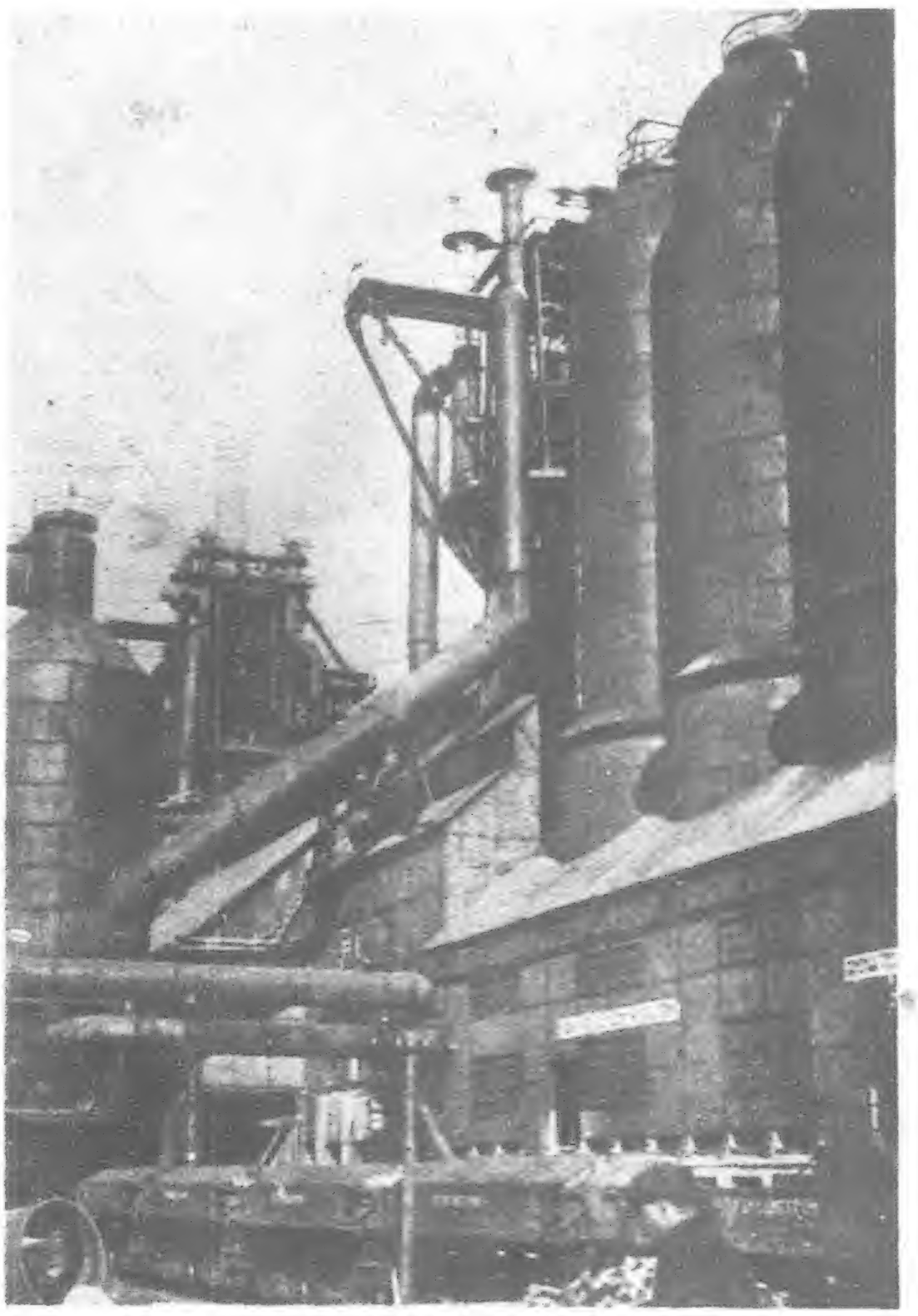
on a broad scale advanced electrolytic methods, obtaining by such methods, in 1937, 70 per cent of the entire output of zinc; to organize the production of tin, nickel, magnesium, and to develop the production of aluminum on a broad scale; to satisfy completely the requirements of the entire national economy and of the power industry in particular for products of non-ferrous metallurgy.

(*f*) To achieve marked advances in the development of the *chemical* industry. The production of all kinds of fertilizers is to be increased ten-fold during the period of the second Five-Year Plan. To develop extensively the production of new chemical products (chemical treatment of hard fuel—coal, peat, shale; new kinds of dyes; plastics; synthetic rubber; etc.); to introduce the newest technological processes in the chemical industry (extensive development of electrothermic and electrolytic methods, the introduction of reaction in gaseous phases, etc.). To strengthen the co-ordination of the chemical industry with other branches of industry (the coke, non-ferrous metals, iron and steel, and other industries); and to increase the utilization of a number of new kinds of raw material.

(*g*) To take all measures to develop production in the most important branches of the *light and food industries* on the basis of the creation of a large machine-building industry, involving the raising of the share taken by automatic looms in the cotton textile industry to 40 per cent by the end of the five-year period; to liquidate the technical backwardness of the linen industry by means of the introduction of high-speed machinery and the radical reorganization of the primary treatment of flax; to carry out an all-round mechanization of knit-goods, clothing and shoe manufacture; to create a large-scale, mechanized meat-packing industry on the basis of the development of combines; to raise the share taken by mechanized fishing to 70 per cent of the total output of the state fishing industry by means of considerable reconstruction of the fishing fleet; extensive reconstruction of the vegetable oil industry.

The accomplishment of the tasks of the technical reconstruction of industry necessitates the successful mastery of the new technique and of the manufacture of new products, which should result in a considerable increase in *labor productivity* and a marked decline in *production costs*. Accordingly, there is scheduled:

(*a*) An increase in labor productivity in industry of 63 per cent in the second Five-Year Plan period, as against 41 per cent in the first Five-Year Plan period.



A view of the blast furnaces 1 and 2 of the Kuznetsk Steel Mill in Siberia

(*b*) A decrease in production costs for all industry of 26 per cent, as compared with the 1932 level, the saving in 1937 arising from such lowering of production costs to amount to not less than 14 billion roubles.

(*e*) Accompanying the lowering of production costs, the attainment of marked improvement in the *quality and assortment* of the products of all branches of the national economy. A considerable decrease in the ash and sulphur content in coal, an increase in the variety of products of the metallurgical industry, an improvement in quality and a raising of the co-efficient of utilization of machinery, an increase in the number of grades of yarn, a marked improvement in the quality of cotton and linen cloth, an increase in the proportion of the finer-weave and worsted grades in the total output of the wool industry, an increase in the share taken by fine wool in woollen cloth, a marked improvement in the quality of soap by raising the fat content, improvement in the quality of footwear both as regards the methods of manufacture and the raw materials used, improvement in the quality of the output of the meat-packing industry by raising the proportion taken by pork, sausage, and lard, improvement in the output of the fish industry by raising the proportion of the better kinds of fish, considerable improvement as regards the quality of output in the flour industry by increasing the share taken by the better grades of flour.

Agricultural output during the five-year period is scheduled to increase from 13.1 billion roubles in 1932 (1926-27 prices) to 26.6 billion roubles in 1937, i.e. a gain of over 100 per cent. The most important branches of agriculture are to attain the following level of output: grain—1,105 million centners, with a yield of 10.6 centners per hectare;* sugar beets—276 million centners, with a yield of 200 centners per hectare; cotton fiber—7.2 million centners, with a yield of irrigated cotton of 12 centners per hectare; flax fiber—9 million centners, with a yield of 3.7 centners per hectare; output of the livestock industry to record an increase of 125 per cent.

The indicated growth of agricultural production can be attained only on the basis of the completion of collectivization and the technical reconstruction of agriculture in its entirety, which necessitates:

(*a*) An increase in the number of machine-tractor stations from 2,446 in 1932 to 6,000 in 1937, all collective farms to be served by machine-tractor stations.

(*b*) An increase in the tractor park from 2,225,000 h.p. in 1932 to 8,200,000 h.p. in 1937, i.e., a gain of 270 per cent; the number of combines to reach 100,000 and the number of automobiles in agriculture 170,000, six and 12 times as many, respectively, as in 1932.

(*c*) Practically complete mechanization of agriculture: in 1937 tractors are to be used for plowing to the extent of 80 per cent and for cultivating to the extent of 70 per cent; harvesting of grain is to be done by tractor harvesters to the extent of 60 per cent; and threshing is to be mechanized 100 per cent.

(*d*) The introduction on a broad scale of such measures as: correct crop rotation (100 per cent), sowing of selected seed (90 per cent of area sown to grain), fall plowing for spring sowing (50 per cent), sowing of crops which enrich the soil for succeeding crops (80 per cent).

(*e*) An increase in the supply of nitrogenous fertilizers during the second Five-Year Plan period: for cotton—from 6 per cent of the sown area to 80 per cent; for sugar beets—from 6 per cent to 40 per cent; in the supply of phosphoric fertilizers—from 9 per cent to the entire area; extensive development of irrigation work, expanding the irrigated area by 1,000,000 hectares.

The schedules set for increase in *freight turnover* by the basic branches of transportation are as follows: railway—from 169 billion ton-kilometers in 1932 to 302 in 1937; river—from 26 to 64; merchant marine—from 18 to 51; automotive—from 1 to 16 billion ton-km. The share in the freight turnover of the country taken by new forms of transportation—automotive and aviation transport—and also by water transport is to be raised, with railway transportation still playing the major rôle.

The *technical reconstruction of transportation* will be carried out along the following main lines:

(*a*) Reconstruction of the most important *railway* lines: electrification of 5,000 km. of railway lines, laying of about 9,500 km. of double track on the most congested trunk lines (Ural-Kuzbas, Trans-Baikal and Ussurisk, Donbas, etc.); increase in the length of

*A Centner = 220.4 pounds, or 1/10 of a metric ton; a hectare = 2.47 acres.

station lines at railway junctions and stations by 8,500 km.; substitution of light by heavy rails over a distance of 20,000 km.; extensive construction of bridges; equipment of 8,300 km. of lines with automatic block signalling; strengthening of the existing road-beds (transition to the use of rubble ballast, increase in number of ties per kilometer of line, etc.).

(*b*) Increase in the park of locomotives from 19,500 in 1932 to 24,600 in 1937, with a simultaneous transition to more powerful and more efficient types of locomotives; more extensive utilization of diesel and electric locomotives.

(*c*) Growth of freight-car park from 552,000 in 1932 to 803,000 in 1937 (in 2-axle units), with a considerable increase in the share taken by large freight cars and the equipment of all freight cars with automatic brakes and not less than half with automatic couplings.

(*d*) Construction of the following important new railway lines: Baikal-Amur trunk line, Akmolinsk-Kartaly, Moscow-Donbas, Karaganda-Balkhash, Ufa-Magnitnaya, and others; increase of the total length of railway lines from 83,000 km. on January 1, 1933, to 94,000 km. on January 1, 1938.

(*e*) *Water transportation*—Extensive construction of artificial waterways or canals: the Baltic-White Sea canal, length 227 km. (first section completed in the first year of the second Five-Year Plan); the Moscow-Volga canal, length 127 km.; the Volga-Don canal, length 100 km. Reconstruction of the Mariinsk* and Moscow River waterways, which—together with the carrying out of hydro-technical work on a big scale on existing waterways (through route along the Dnieper, sluicing of the Sozh River, reconstruction work on the Middle Volga)—will insure in the main the reconstruction of the waterways and the creation of a unified network of waterways in the European section of the U.S.S.R., connecting the White, Baltic and Caspian Seas. The length of navigable waterways is to increase during the second Five-Year Plan period from 84,000 km. to 101,000 km., with considerable improvement in navigation conditions on such waterways. The mercantile and river fleets are to be radically renewed and reconstructed.

(*f*) *Automotive transport*—The automobile park is to increase from 75,000 cars on January 1, 1933, to 580,000 cars on January 1, 1938, a growth of almost 700 per cent; wide-scale construction of a network of dirt and paved highways, with the practical liquidation of the paucity of roads and an increase in the total length of the road network of the country by 210,000 km., not counting the considerable amount of construction carried out by local resources.

(*g*) *Civil aviation*—The network of airlines of all-Union significance is to grow from 32,000 km. to 85,000 km., i.e. an increase of almost 200 per cent. At the same time there is to be extensive construction of local airlines, bringing the length of such lines under exploitation in 1937 to 35,000 km.

(*h*) Marked progress is to be achieved in the mechanization of *loading and unloading operations* in transportation, mechanization of such work in railway transportation to be trebled (from 18 to 57 per cent) and in water transportation approximately quintupled (from 14 to 72 per cent for the mercantile marine and from 12 to 56 per cent for river transport).

Labor productivity is scheduled to increase during the second Five-Year Plan period as follows: in railway transportation—43 per cent and in water transportation—86 per cent; the decrease in production costs for transportation as a whole is set at 40 per cent, for railway transportation—10.5 per cent, for water transportation—36 per cent, and for automotive transportation—54 per cent.

A decisive prerequisite for the carrying out of the technical reconstruction program, the mastery of technique, and the fulfilment of the schedules for labor productivity is the *training of skilled workers, technicans and engineers*, the solution of the problem of the creation of a Soviet, proletarian technical intelligentsia. Accordingly, the following program for the training of cadres (skilled personnel) during the second Five-Year Plan period is set:

(*a*) The training of five million skilled workers, including 2.5 million in factory schools, over 1.5 million in agricultural schools and courses (tractorists, brigade leaders, etc.), and 700,000 in schools and courses for chauffeurs.

(*b*) Graduation during the second five-year period of 340,000 specialists who have completed the college course, as against 170,700 in the first Five-Year Plan period, an increase of 100 per cent, and of 900,000 specialists who have completed the secondary technical school (technicum), as compared with 308,000 in the first Five-Year Plan period, an increase of 200 per cent.

(*c*) An increase in the number of skilled specialists in all branches of the national economy from 2.7 million to 4.0 million, a gain of 46.5 per cent; the number of specialists in industry to increase by 57 per cent, in transportation and communications by 60 per cent, and in agriculture by 100 per cent.

Program of New Construction

The completion of the technical reconstruction of the national-economy and the fulfilment of the outlined production schedules in industry, agriculture and transportation necessitate the carrying out during the period of the second Five-Year Plan of a large construction program. The total outlay for *capital construction* in the national economy during the second Five-Year Plan period is set at 130.4 billion roubles (in 1933 prices), as compared with 50.5 billion roubles during the first Five-Year Plan period, to be distributed as follows:

Students of the Moscow Institute of Railroad Construction at a laboratory demonstration

(*a*) *Industry*—69.5 billion roubles, as against 24.8 billion roubles during the first Five-Year Plan period; for industry manufacturing producers' goods—53.4 billion roubles, as against 21.3 billion roubles, or an increase of 150 per cent; for industry producing consumers' goods 16.1 billion roubles, as compared with 3.5 billion roubles, or a gain of 360 per cent.

(*b*) *Agriculture*—15.2 billion roubles, as against 9.7 billion roubles during the first Five-Year Plan period, or an increase of over 50 per cent.

(*c*) *Transportation*—26.3 billion roubles, as against 8.9 billion roubles, or a gain of 200 per cent.

The larger increase in capital construction scheduled for light and food industries and for transportation, as compared with that for other branches of the nationale conomy, insures for them a more rapid rate of development.

New and reconstructed enterprises starting operation during the second Five-Year Plan period are valued at 132 billion roubles, as compared with 38.6 billion roubles in the first Five-Year Plan period, distributed as follows: in industry—69.1 billion roubles, as against 15.7 billion roubles; in agriculture—15.4 billion roubles, as compared with 9.2 billion roubles; and in transportation—25.6 billion roubles, as against 7.7 billion roubles.

The scheduled volume of capital construction and the program for the starting of exploitation of new and reconstructed enterprises insures a gigantic increase in the *productive-technical capacity* of the Soviet Union and the creation of necessary reserves of capacity in the most important branches of the national economy, viz.:

(*a*) The total basic capital is to increase during the five-year period from 85 billion roubles to 195 billion roubles (in 1933 prices), a gain of 130 per cent, distributed as follows: industry—from 25.5

*Important artificial waterway connecting the Volga and Neva Rivers.

to 77.0 billion roubles; agriculture—from 11.4 to 22.6; transportation—from 19.8 to 38.5 billion roubles.

(*b*) In the most important branches of industry productive capacity is to increase as follows: in the iron and steel industry (pig iron) by 130 per cent, coal industry—over 100 per cent, manufacture of generators 140 per cent, automobile industry almost 300 per cent, locomotive works 220 per cent, car-building plants 290 per cent, regional power plants 150 per cent, shoe industry 100 per cent, cotton textile industry 50 per cent, linen industry over 100 per cent, sugar industry 50 per cent, in large meat-packing plants 150 per cent.

Special attention is to be concentrated on the following most important construction works:

In machine-building—Completion of the following plants, the construction of which was commenced in the first Five-Year Plan: the Ural heavy machinery plant, annual capacity 100,000 tons; the Kramatorsk heavy machinery works, capacity 150,000 tons; the Ural chemical apparatus plant; the Lugansk steam locomotive works, annual capacity 1,080 "FD" locomotives; the Orsk steam and diesel locomotive works, capacity 500 steam and 500 diesel locomotives; the Kashira electric locomotive plant, capacity 300 main-line electric locomotives; the Ural car-building plant, capacity 54,000 four-axle freight cars; the Ufa motor plant, capacity, 50,000 motors; the Kharkov turbo-generator plant, annual capacity 1.5 million kw. Expansion of the Gorky automobile plant to a capacity of 300,000 cars, of the Stalin automobile plant in Moscow to a capacity of 80,000 cars, of the Yaroslavl plant to a capacity of 25,000 five-ton trucks, etc. Construction during the second Five-Year Plan of the Ufa and Stalingrad automobile plants, annual capacity of each 100,000 three-ton trucks; Samara automobile plant, capacity 25,000 five-ton trucks; machine-building plants manufacturing grinding machines, radial boring machines, gear-cutting machines, automatic and heavy machine-tools; a new, immense ball-bearing plant, annual capacity 24 million bearings; the Ural plant for the manufacture of electrical apparatus and transformers; a group of plants for the manufacture of machinery for the textile industry and of equipment for the food industry, etc.

An Experimental Station for the Cultivation of Cotton in Central Asia

In electrification—Construction of 79 regional power plants, including completion of construction of the following plants: Zuevka (250,000 kw.); Gorky (204,000 kw.); Shatura (180,000 kw.); Dubrovka (100,000 kw.); Svir No. 3 (96,000 kw.); Dnieproges (558,000 kw.). Construction of a number of new large central stations: Bobriky (250,000 kw.); Kemerovo (148,000 kw.); several new, powerful stations in the Donetz Basin; the following hydro-electric stations: Chirchik No. 1 (170,000 kw.); Kanakir (88,000 kw.); Khram River (60,000 kw.); Svir No. 2 (144,000 kw.); Tuloma, etc. Further construction work on the power plants of the Middle Volga project: Yaroslavl (100,000 kw.); Perm (310,000 kw.); Gorky (200,000 kw.). Construction of a number of large central heating plants for the central heating of cities—the Moscow-Narvsk in Leningrad, the Stalin and Frunze in Moscow, the Sormovo-Kanavino, the Krasnozavodsk in Kharkov, and others; and of a number of large factory power plants of regional significance—Magnitogorsk (198,000 kw.); Kuznetz (108,000 kw.), and others.

In the coal industry—Extensive construction of large mines and the starting of operations of 178 mines, with an annual capacity of 143 million tons of coal.

In the oil industry—Construction of a new group of oil refineries (46 pipe-stills for primary refining, 93 cracking units). Construction of pipe-lines for oil and oil products with a total length of over 4,000 km.

In the iron and steel industry—Completion of construction of the Magnitogorsk plant to a capacity of 2.7 million tons of pig iron, and of the Kuznetz, Zaporozhye, Nizhne-Tagil, Azovstal, Krivoy Rog, Lipetsk, Tula and other plants. Continuation of construction work on and start of operations of the first units of the Bakal Khalilova, second Kuznetz, and Far Eastern plants, and of several pipe-rolling mills, etc.

In the non-ferrous metals industry—Lake Balkhash copper combine (capacity 100,000 tons); Central Ural (50,000 tons). Completion of construction of the Kazakstan (60,000 tons of lead) and Altai lead and zinc plants, the Cheliabinsk and Ordzhonikidze zinc plants, and others; completion of construction of the Volkhov and Dnieper aluminum plants; construction of new aluminum plants—Ural (25,000 tons) and Karelian (8,000 tons); construction of magnesium, nickel and other enterprises in the non-ferrous metals industry.

In the chemical industry—Construction of new fertilizer and synthetic rubber plants and factories manufacturing soda, sulphuric acid, rubber goods, plastics, aniline and lacquer dyes, artificial fiber, etc.

In light industry—Construction of 15 large cotton textile enterprises, including the Tashkent, Barnaul, Khodzhent, Chardzhui and Transcaucasian combines, with an annual capacity of 200,000 spindles each; 12 large woollen mills, each with a capacity of from 8 to 15 million meters of cloth, 12 linen mills, each with a capacity of from 18,000 to 27,000 spindles; 18 large enterprises of the knit-goods industry; 11 silk mills; and 21 shoe factories, with a capacity of 100 million pairs.

In the food industry—Completion of 17 meat-packing plants, the construction of which was started in the first Five-Year Plan; commencement of construction work on 23 new combines; construction of a large number of sugar mills, six soap factories, of canneries, vegetable oil refineries, candy factories, etc.; a great increase in the fishing fleet.

In the timber industry—Construction of a large number of saw-mills, wood distillation plants, etc.; completion of construction of the Kama and Kondopoga cellulose-paper combines and the Syas cellulose plant; construction of the Bashkir and Krasnoyarsk paper mills, etc.

Extensive construction and reconstruction of thousands of enterprises of *local* industry manufacturing consumers' goods, with an investment during the five-year period of about two billion roubles.

In municipal construction—Extensive work in the field of converting hundreds of industrial centers into well-arranged cities; construction of thousands of apartment houses with apartments equipped with all conveniences and with a total dwelling space of 64 million square meters; development of work in the field of city

planning, improvement of municipal transportation, water supply and sewage systems, street paving, planting of trees and shrubbery, etc. Construction of Houses of Soviets, houses of technique, parks of culture and rest, stadia, theaters, clubhouses, moving-picture theaters; construction in Moscow of the Palace of Soviets and the first subway in the Soviet Union, the first line of which is to start operations in 1934.

The scheduled program for the extensive development of new construction necessitates marked advances in the *allocation of productive forces*:

(*a*) On the basis of the development of old industrial centers there are being created new bases of industrialization in the eastern regions of the Union (Urals, West and East Siberia, Bashkiria, Far Eastern Region, Kazakstan and Central Asia), where intensive development is under way in the machine-building, metallurgical, coal, oil, power and other branches of industry. It is in the *eastern* regions that about half of all capital investments for new construction in heavy industry is to be expended. In 1937 the eastern regions are to account for one-third of the output of pig iron, as against one-fourth in 1932, for more than one-third of the output of coal, as compared with one-fourth in 1932, for about one-fifth of the total power output (of regional power plants), as against 6.5 per cent in 1932, and for one-tenth of the output of the machine-building industry, as compared with 5 per cent in 1932.

(*b*) Construction is to be completed of the *second coal-metallurgical base* of the Union, the Ural-Kuznetz combine, on the construction of which there is to be expended during the second Five-Year Plan period about one-fourth of total capital investments in the national economy of the U.S.S.R. and more than one-third of all capital investments in heavy industry. The Ural-Kuznetz combine is to account in 1937 for one-third of the output of the iron and steel industry, more than one-fourth of the total coal output of the country, one-sixth of the total production of power by regional power plants, and about one-tenth of the output of the machine-building industry.

(*c*) *Industry is to be allocated in closer proximity to the sources of raw material* on the basis of the development of new regions. Marked advances are to be made in such allocation of the light and food industries: out of the total of 15 cotton textile mills to be constructed during the second Five-Year Plan period 10 are scheduled to be constructed in Central Asia, Siberia and Transcaucasia, which will make possible a twenty-fold increase in the output of cotton cloth in Central Asia, as compared with an average increase for the U.S.S.R. as a whole of 140 per cent, and will constitute a sound foundation for textile production in these regions. In the linen industry there are being established important bases for the working up of flax in White Russia and in the Western and Gorky Regions. There are being created new raw material bases on the foundation of which new sugar mills will be constructed (West Siberia, Kirghizia, Far Eastern Region, Transcaucasia, etc.). In the principal centers of production of agricultural raw materials there are being built leather, woollen, vegetable oil, and other enterprises in the light and food industries. The output of various types of local fuel is to record extensive growth, thereby lessening the dependence of a number of districts on fuel transported from distant points.

(*d*) *In agriculture*—Considerable increase in grain production in the principal grain districts and the creation of a sound wheat base in the central and northern districts; an enormous increase in the output of industrial crops in the principal regions where they are now grown, and also the creation of a new sugar-beet base in the East; extensive development of new high-value crops, particularly in the sub-tropical districts—all this to insure the solution of the problem of the correct allocation of the principal branches of agriculture and the specialization of districts according to crops and branches of agriculture.

(*e*) *In transportation*—Together with the reconstruction and strengthening of the principal transportation lines extending east and south from the center, the construction of a large group of new railway lines and waterways, connecting the new industrial centers with the general transportation network of the Union and constituting the basis for the economic development of new regions (Karaganda—Balkhash, Ufa—Sterlitamak, Rubtsevka—Ridder, and Tomsk—Chulym railway lines, Baltic-White Sea canal, etc.)

(*f*) Extensive industrial construction in regions formerly *backward* in an industrial sense, such as the Middle Volga Region, Tatar Republic, North Caucasian Region, Central Black Soil Region, Transcaucasia, Karelia, Murmansk district, Far Eastern and East Siberian Regions, etc., on the basis of the development of large-scale industry in these regions.

(*g*) Intensive development of construction in the field of education, health, art, and the press in the *republics and areas inhabited by the national minorities.*

(*h*) Further development of the *old industrial regions* of the U.S.S.R. on the basis of a continuation of the specialization begun in the first Five-Year Plan period and a more equalized allocation of industry within these regions.

Program for Raising the Material and Cultural Level of the Workers and Peasants

The elimination of unemployment and the provisioning with work of all workers, both of hand and brain, accompanied by the systematic introduction by the Soviet state of improved working conditions, the shortening of the working day to seven hours, and the existence of favorable opportunities for raising the productive skill and general cultural level of the workers—all this makes it possible for the entire mass of workers, while steadily increasing their labor productivity, to advance rapidly in the matter of improving their material well-being.

The completion during the period of the second Five-Year Plan of the collectivization of all peasant households, the liquidation of the kulak class, the abolition of the division of the peasantry into possessing and non-possessing strata, and the eliminating connection therewith of poverty and pauperism in the village, accompanied by a steady economic and organizational strengthening of the collective farms and the rapid growth of their machine-technical base—all this creates unprecedentedly favorable conditions for a rapid advance in the material level of the collectivized peasant masses and for the attainment of a cultural and well-to-do life for the collective farmers and places the rate of this development in direct dependence upon the organizational capacity and labor productivity of the collective farmers themselves.

Accordingly, the following goals are set in respect to raising the material and cultural level of the workers and peasants:

1. (*a*) Increase of 30 per cent in the *number of wage-earners* in all branches of the national economy by the end of the second Five-Year Plan; in large-scale industry of 40 per cent.

(*b*) Increase in *real wages* of 110 per cent, based on the complete liquidation of parasitic consumption, a rapid growth of the national income, an increase in the consumption norms for such products as meat, fats, fish, eggs, sugar, and manufactured goods of from 150 to 200 per cent, a decrease in retail prices of from 35 to 40 per cent, and a further improvement in the living conditions of the workers.

(*c*) Increase of 59 per cent in the *total wage fund* of all wage-earners in the entire national economy; of 76 per cent in that of those employed in large scale industry.

(*d*) Considerable increase in state expenditures for social insurance, education, health and other social services for the workers, such expenditures to rise during the five-year period from 4.3 billion roubles to 9.3 billion roubles, a gain of over 100 per cent.

(*e*) Increase of 150 per cent in the number of workers of town and village served by *socialized restautants.*

(*f*) During the second Five-Year Plan period not only is the liquidation of illiteracy of the entire population of the Union, the liquidation of semi-literacy of the adult, able-bodied population, and the introduction of universal, compulsory elementary education to be completed, but *universal, compulsory polytechnical education* embracing the seven-year course is to be introduced in the village as well as the town, this task having been basically completed as far as the town is concerned during the course of the first Five-Year Plan period. The total number of students (in primary and intermediate schools, workers' faculties, factory schools, technicums, colleges and universities) is to increase to 36 million, as against 24.2 million in 1932, or to 197 per 1,000 inhabitants, as compared with 147 per 1,000, not counting pre-school institutions, which in 1932 embraced 5.2 million children.

(*g*) Extensive development of mass *extra-mural education*, closely connected with the organization of the leisure time of the toilers for purposes of cultural advancement; increase in the number of clubs in town and village from 6,800 to 10,900 (the increase in towns amounting to 10.5 per cent, in villages to 130 per cent) and in the number of public libraries from 15,000 in 1932 to 25,000.

(*h*) Considerable further advancement in the field of *health preservation* of the toilers, involving first of all the extensive introduction of sanitary-prophylactic measures; increase in expenditures for health preservation, workers' leisure, and physical culture from 5.4 billion roubles in the first Five-Year Plan period to 20.5 billion roubles in the second.

Increase of 44 per cent in the number of hospital beds in towns and of 98 per cent in the number of those in the rural districts; increase of 164 per cent in the number of places in day nurseries in towns and of 129 per cent in the number of those in rural communities.

(*i*) Increase during the five-year period in the number of towns with water systems from 366 to 440; in the number of towns with sewage systems from 55 to 125; of towns with street-car service from 50 to 70.

(*j*) Accordingly, capital investments in construction for municipal, housing and cultural needs during the second Five-Year Plan period are set at about 32 billion roubles, or about one-fourth of all the capital investments in the national economy of the U.S.S.R., to be distributed as follows: housing—13.4 billion roubles, municipal construction—6.2 billion roubles, education—3.1 billion roubles, health preservation—2.9 billion roubles.

2. The task of raising the standard of living of the workers and peasants necessitates an all-sided *development of commodity turnover* on the basis of increased production of manufactured goods of general consumption and improvement in the provisioning of the towns with agricultural produce as follows:

(*a*) An increase in commodity turnover of from 150 to 200 per cent, rising from 31.9 billion roubles in 1932 to 94.6 billion roubles in 1937 (1932 prices), with a trebling of the output of consumers' goods produced by the light and food industries.

(*b*) Increase in the retail trade network of state and co-operative organizations of 37 per cent, at the same time carrying out its technical reconstruction.

(*c*) Lowering of the average level of retail prices by 35-40 per cent as compared with 1933.

3. The growth of the *national income* is set at 137 per cent (from 45.5 billion roubles to 108 billion roubles) and the growth of the consumption fund in the national income at 160 per cent, accompanied by a tremendous increase in the capital accumulations of socialized economy and also a growth of state reserves.

The basis of economic activity must be the struggle for the introduction of economic accounting in all links of the national economy, for improvement in planning and financial discipline, and for the further strengthening of the Soviet rouble, of that most important lever for the strengthening of economic accounting and of the economic bonds between town and village.

* * *

The second Five-Year Plan for the development of the national economy guarantees:

(*a*) The liquidation of capitalist elements and of classes in general, the final liquidation—on the basis of the completion of the collectivization of the peasant households and the inclusion in co-operatives of all handicraft workers—of private property in the means of production; establishment of the socialist method of production as the only method of production, accompanied by a transformation of the entire working population of the country into active, conscious builders of a socialist society.

(*b*) Completion of the technical reconstruction of the entire national economy of the U.S.S.R. on the basis of the development of heavy industry (that branch of industry manufacturing producers' goods), created during the period of the first Five-Year Plan and undergoing further rapid development.

(*c*) More rapid advance in the well-being of the workers and peasants, accompanied by marked improvement in housing and municipal economy.

(*d*) Strengthening of the economic and political position of the proletarian dictatorship on the basis of the union of the working class and the peasantry for the final liquidation of capitalist elements and of classes in general.

(e) Further strengthening of the defenses of the country.

The fulfilment of the second Five-Year Plan necessitates the organization of the work in such manner as to insure:

First, proper functioning and concreteness in the day-to-day work of the economic leadership, making no concessions with bureaucratic perversions in the economic apparatus;

Second, concentration of the best engineering and technical forces at decisive production points and not in offices;

Third, correct organization of the wage scale of workers, providing an economic stimulus for an increase in labor productivity;

Fourth, stimulation of socialist competition, particularly with a view to a better mastery of the new technique and of the manufacture of new products;

Fifth, strong labor discipline both in industrial plants and on state and collective farms;

Sixth, revolutionary watchfulness against enemies of the dictatorship of the proletariat and real responsibility to the working class and its party for the delegated task;

Seventh, further strengthening of the union between the workers and the toiling peasants.

During the second Five-Year Plan the U.S.S.R. is making a big step forward in the matter of out-living the age-old contradiction of human society—the contradiction between town and village—and is creating all the necessary prerequisities for the elimination of this contradiction. Agriculture is assuming the same social form as industry; agricultural labor is being transformed into a variety industrial labor; there is a tremendous expansion of the transportation links between city and village; the rates of increase of industrial and agricultural production are becoming much more nearly identical; the material and cultural standards of the toilers of town and village are approaching the same level.

The U.S.S.R. in the second Five-Year Plan is being converted into a country independent in a technico-economic sense and into the foremost state in Europe as regards technique.

Colombo Aerodrome

The following circular has been issued by Mr. R. C. Brighten, Hon. Secretary of the Aero Club of Ceylon, to members. It sums up the present position with regard to the proposed aerodrome for Colombo, and is optimistic about the chances of regular flying in Ceylon during the present year.

"About the middle of last year the Club worked out a scheme for acquiring land to construct an aerodrome near Colombo, and to place buildings and landing facilities thereon. A call for tentative financial assistance was made to members and a few others; and the generous response was an indication of the keen interest in everything associated with flying held by the people of Ceylon.

"By applications and interviews the Club endeavored to arrange concessions and permits with Government; co-operated with the Air-Mail service interests and with two organizations willing to start activities once a site was obtained. These activities, coupled with Government's earnest desire to have Air-Mail continuity to Colombo, have had the very satisfactory result that Government has asked the Club to be patient whilst Government itself seriously investigates Colombo aerodrome possibilities.

"Various rumors have appeared in certain sections of the Press, some being reasonably accurate, others being obviously much exaggerated. I am able to advise you definitely that sites are being inspected, values being ascertained and recommendations being drawn up. In due course estimates of the costs of acquisition, preparation, and maintenance will be submitted to the Ministry concerned, for submission to the State Council if approved.

"Many State Councillors wholeheartedly support this project, and it is to be hoped that their influence will be sufficient to remove the unfavorable impression of Ceylon's airmindedness which is held internationally at present.

"Once an aerodrome is available as a land base, local interests and others are eager to start land 'plane and sea-plane activities all over the Island and beyond. Should the Club be favored by Government with a subsidy, as is common all over the world, the Club may own machines and become active in its own right. If not, tentative arrangements have been made for contract-tuition and solo flying from the companies which would then be responsible for all tuition and maintenance. Doubtless members or groups of members would soon obtain private 'planes.

"Membership has jumped from 95 a few months ago to 112 at the present moment, and we look forward with confidence to flying becoming an accomplished fact in Ceylon some time in 1934."
—*Times of Ceylon.*

Regulation of the Fen Ho for Flood Protection and Conservancy of Winter Flow as an Aid to Irrigation

A Report Prepared from Surveys Made in 1933 for the Shansi Water Conservancy Commission

By O. J. TODD, Chief Engineer, China International Famine Relief Commission

Foreword by L. H. WANG, President, Shansi University

PART ONE

For thousands of years Shansi Province in China has been considered a rather poor country on the whole due to its great areas of barren loess hills cut up by erosion and, for the most part, bare of forest cover. Of its 1,000,000 square *li* of total area little over 10 per cent of this, or 600,000 ching, is tillable. Rainfall is deficient and little has been done by way of irrigation except to a small degree along the Fen Ho.

Most of the lands of South Shansi lie so high above the rivers that little opportunity is offered for irrigation from streams. North Shansi's rivers are too swift and sandy and with inconstant flow so that irrigation there is also difficult. Out of Shansi's 100 and more hsiens or counties there are only 39 that have any sort of irrigation. Even in these most of the canals are of a temporary nature being often filled with mud and redug only when necessity demands.

If scientific methods were employed and the right men put in charge several rivers and springs could be used to much greater advantage. This includes the Sangkan Ho, Hutu Ho, and Hun Ho, in the North, and Ching Chang Ho, Ch'o Chung Ho, Chin Ho, and Hui Ho, in the South of the Province, as well as several other small rivers and good springs.

In 1917 the Bureau of Six Civil Affairs Departments made the water problem one of its main concerns. Irrigation was officially sponsored and three companies were organized in North Shansi to irrigate lands along the Sangkan Ho and Hun Ho. These companies are semi-official and are known as the Kwang Chi, Fu Shan, and Kwang Yu. Each serves several thousand ching of land but the income is small and the financing inadequate resulting in poor supervision and upkeep.

Of the 156 irrigation canals in the 39 hsiens in Shansi, those operated by private or semi-private companies irrigate 447,000 mou while canals belonging to the farmers can irrigate 268,000 mou. In addition to these canals 3,300 wells irrigate 14,000 mou, thus making a total of more than 700,000 mou of land with irrigation facilities in 39 hsiens including Taiyuan, Yutse, Chiaocheng, Chingyuan, etc.

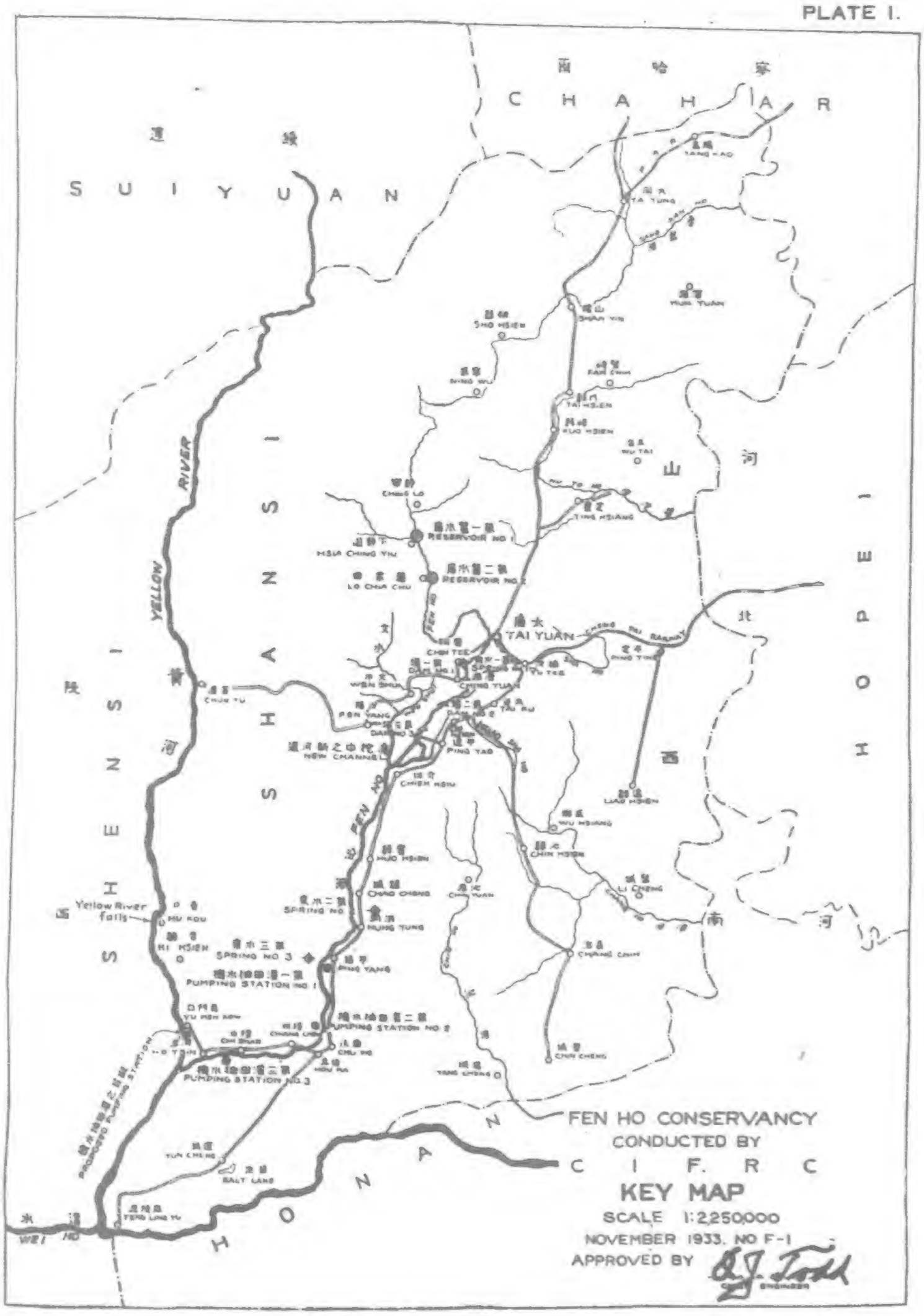
The chief irrigation systems along the Fen Ho have heretofore been served by eight earthen diversion dams. Their irrigation period runs for 130 days per year during which time, in years of low water, the river is drained dry leaving nothing to supply domestic needs of cities to the south such as Lingshih. Much has been expended each year in material and human labor to rebuild these eight earthen dams that supply water to little over 2,000 ching of land. However in 1929 the Shansi Government decided to employ more modern methods and in 1930 built the first of three masonry dams with suitable gates and of permanent type. These three dams will serve 3,000 ching of land.

Along the southern section of the Fen Ho in Hotung district are large areas of comparatively level farm lands lying too high to permit of irrigation by diversion from the river. Therefore in 1930-31 three pumping plants were installed to serve the new irrigation projects of Hsiang Ling, Chiangchow and Hotsin. Several large springs in this region can also be developed to serve more lands than they have formerly irrigated.

In the Ten Year Plan drawn up in 1932 for Shansi Province the development of water resources is included as an important undertaking. In this plan it is proposed that the following be attempted:

(1) Irrigation by wells, 200,000 mou; (2) Irrigation by pumping plants, 100,000 mou; (3) Irrigation by diversion from rivers and springs, 7,700,000 mou; (4) Construction of a storage reservoir on the upper Fen Ho; (5) Bringing Yellow River water onto Shansi lands; (6) Developing the Yellow River falls at Hu Kow for electric power.

PLATE I.



Note: The following English equivalents of Chinese measurements should be used

a mou = .15 + acres (commonly taken as 1/6)
a ching = 100 mou = 15 acres.
a li = .35 + miles (commonly taken as 1/3)
a hsien = a county.
a fang = 116.—cubic feet.

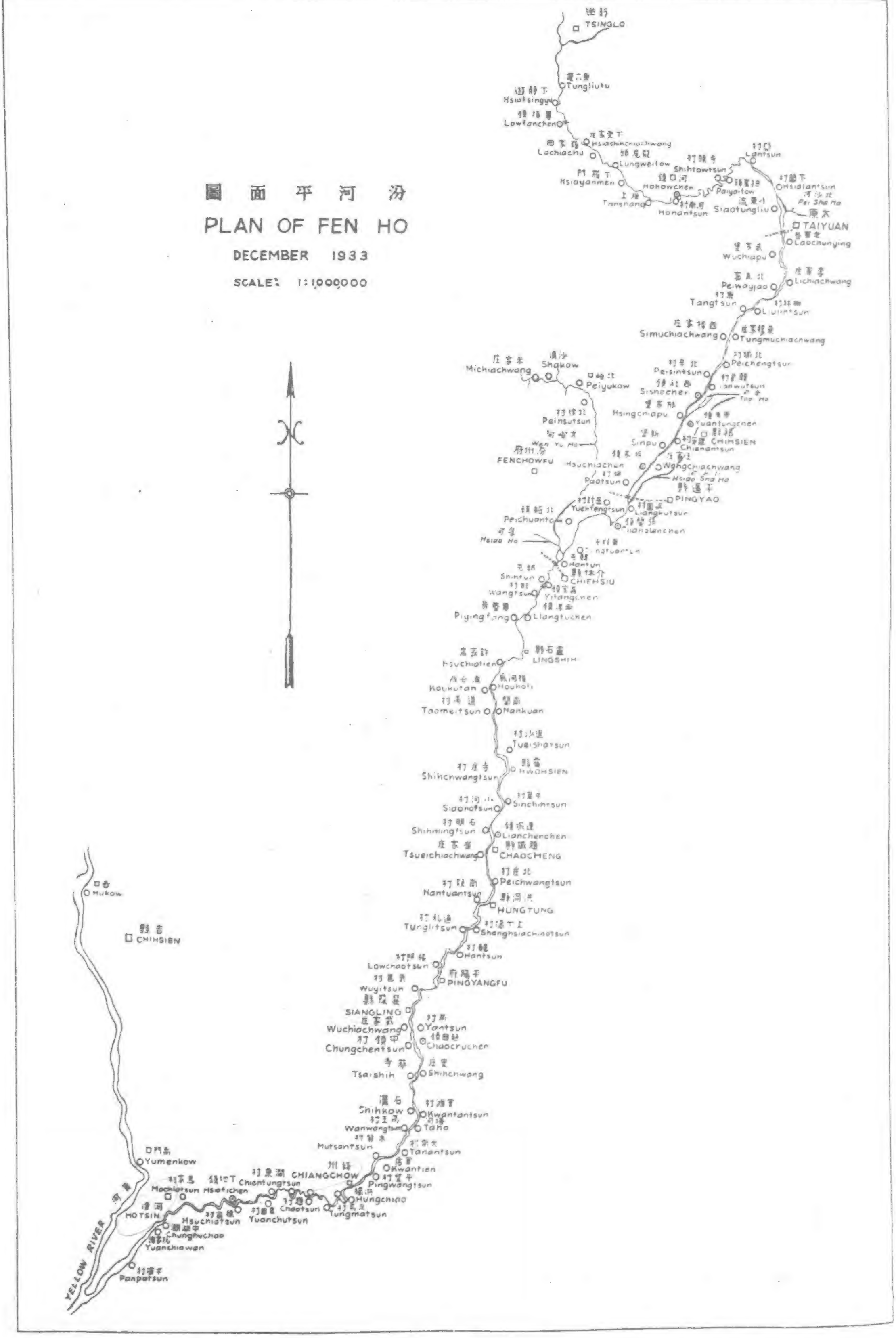
PLATE II

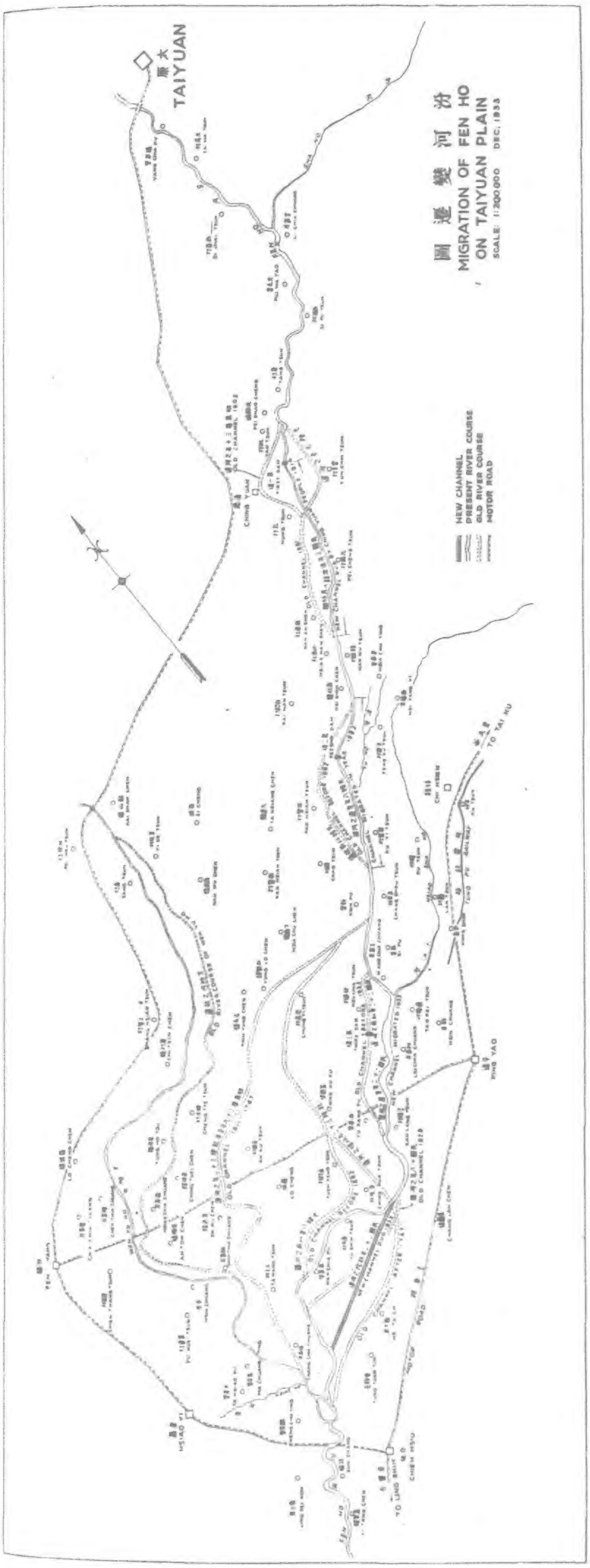
汾河平面圖

PLAN OF FEN HO

DECEMBER 1933

SCALE: 1:1,000,000





Early in 1933 the Shansi Government invited the China International Famine Relief Commission to make studies of the Fen Ho problem and recommend a program for water conservancy and flood control. These studies have been made under the direction of their Chief Engineer whose report follows. It is a pleasure to submit this brief historical review by way of prefacing this report.

* * *

For the purpose of indicating information in hand at the end of 1933 on which to base estimates of a plan for regulating the flood flow of the Fen Ho and conserving its waters to improve irrigation facilities, this report is prepared. Many times in the past the problem of river regulation has been raised, but no comprehensive measures have ever been taken to solve it. Difficulties have arisen over floods in years of maximum flow and over drought in years of light rainfall and minimum river flow. But the gathering of necessary hydraulic data had not been made a matter of major concern. Very little was known as to what could be done with Shansi's rivers and particularly the Fen Ho.

A search for old data in late 1932 showed that little was at hand on which to base reliable estimates of costs of future improvements. It was evident that field studies of a rather intense nature were needed. Such studies were arranged and carried out from February to late December 1933. This report tells of those studies, draws conclusions from the data gathered, and proposes a plan for training the Fen Ho so that the Province of Shansi may benefit far more than in the past by conserving its available water supply from this river and its tributaries. It also proposes river regulation that will greatly diminish the flood hazards particularly in the Fen Ho valley of the Taiyuan plain. Estimates of cost and time required for construction are submitted based on these 1933 studies.

Further than merely assembling facts as to available water supply and suggesting methods of conserving same and safeguarding valley lands from floods, this report calls attention of all friends of China to the economic benefits of a plan such as is herein outlined. It tends strongly towards stabilization of a region where people live in comparative harmony and safety and health. It tends to insure against future famine a region much larger than the valley of the Fen Ho, for it insures a grain supply that can be readily moved by rail to other less fortunate regions in north or central China. That Shansi has experienced serious droughts in past decades must be borne in mind by all students of economics. It is the part of wisdom to protect this section of China from calamities that cause extreme food shortages and death by famine as has occurred in the not too distant past.

Organization of Investigations

The flood of the summer of 1932 caused many villages to be flooded out and large areas of farm lands with growing crops to be inundated. The city of Taiyuanfu was also flooded in its western sections. The losses in the Taiyuan plain totalled several million dollars. Aid was requested from outside. Little came. As Chief Engineer of the China International Famine Relief Commission I made an investigation of the situation in September of that year. The following month I assisted in showing Dr. David A. Brown, Chairman of the Board of Directors of China Famine Relief, U.S.A., something of this Shansi situation. On this occasion Marshal Yen Hsi Shan urged the need of conservancy work and river regulation for the Fen Ho. Financial aid was sought but no suitable plans were available. A search of the archives produced only a meagre supply of hydraulic data on which to base reliable estimates of cost of a flood prevention or a water conservancy plan. Dr. Brown recommended the preparation of plans on which reliable estimates might be based.

Following the suggestions made at the time of Dr. Brown's visit to Shansi arrangements were made whereby the China International Famine Relief Commission undertook to handle these investigations under my direction, my services being donated for part time through 1933 by our Commission. I was invited by the Shansi Government to become a member of the Shansi Water Conservancy Commission early in 1933 and by February we had our first survey parties in the field. The field work was gradually expanded and carried on throughout 1933.

A head office for the Fen Ho studies was established in Taiyuanfu where a complete organization was set up as has been done

elsewhere in China by the Famine Commission. Standard accounting practices were followed and regular reports rendered to the C.I.F.R.C. in Peiping. The work went forward quite independent of other branches of the Shansi Government.

When the work was in full swing we had as many as eight parties of engineers working on various problems. These included investigations and surveys of reservoirs, hydrographic studies, running levels for placing the first set of dependable bench marks along the Fen Ho, surveys of small irrigation districts that required extension, studies of several large springs tributary to the Fen Ho, making a topographical survey and map of the Taiyuan plain, laying out and supervising the digging of a new cut-off channel 11 miles long between Pingyao and Chiehsiu to straighten the Fen Ho, making borings to test for depth to bed rock on the upper Fen Ho at two important dam sites, making storage studies on the Hsiao Sha Ho (a tributary) and on the Wen Yu Ho (a tributary).

At the Taiyuanfu head office maps were completed where it was not practical to finish them in the field. The various field parties were supplied by this office without referring to Peiping.

Many trips were made by myself in advance of the survey parties and on these I was often accompanied by my engineer colleague on the Conservancy Commission, Mr. L. H. Wang, President of Shansi University. These field trips were made by auto, on mule-back and afoot. The two trips to the upper Fen Ho were difficult and required several days travel on mule or horse-back and on foot. Investigations of the Fen Ho required many fordings either on foot or on a mule. The visit to the falls of the Yellow River was by coal boat and by mule-back over very steep trails. Other trips were made by auto, since a motor road goes close to the Fen Ho in its southern stretches. Our engineers familiarized themselves with this Fen Ho country in a way that had never been done before by investigators. Our report, therefore, stands almost exclusively on the information we gathered in the field during 1933.

As this is being written supplementary surveys are going forward on the Fen Ho this winter and further information is being gathered on construction costs, including cost of haul by methods more economical than those used heretofore. The same organization that was set up for this Fen Ho study will continue to study other rivers of the province.

The No. 1 Reservoir Site above Hsiachingyao on the Upper Fen Ho

Financing and Progress of the Work

From the beginning of these studies the financing has been all that could be desired. The Shansi Water Conservancy Commission has supplied funds as required by me and we have never had to go in debt, or delay payments to staff. The cost of the studies including the preparation of the report will total approximately $70,000.00 Chinese silver ($23,000.00 U.S.). This is considered a very reasonable figure for studies of this extent. Good topographical sheets for the Taiyuan plain were made at a lower cost than has heretofore been recorded for work of a similar nature and quality in China.

A dam site on the Hsiao Sha Ho

The work has gone forward without hindrance from farmers or outlaws. We found the country peaceful and the country people helpful. Our stakes were not stolen as has been the case in some provinces. The engineers worked hard and made a record for survey work in Shansi though much of their staff was rather young. A number of new graduates from Peiyang University and Shansi University were absorbed into the field parties. The discipline was rather hard but the casualties comparatively few. Rainy weather did not seriously hold up the work.

Hydrographic measurements and silt tests were made continuously for six months covering all the high water period and some of the low. In these, great care was taken and many checks made to get as accurate results as possible. Float gauging at Lantsun was compared with current meter gauging from the bridge at Taiyuanfu. Rainfall

Profile of Fen Ho, December 1933

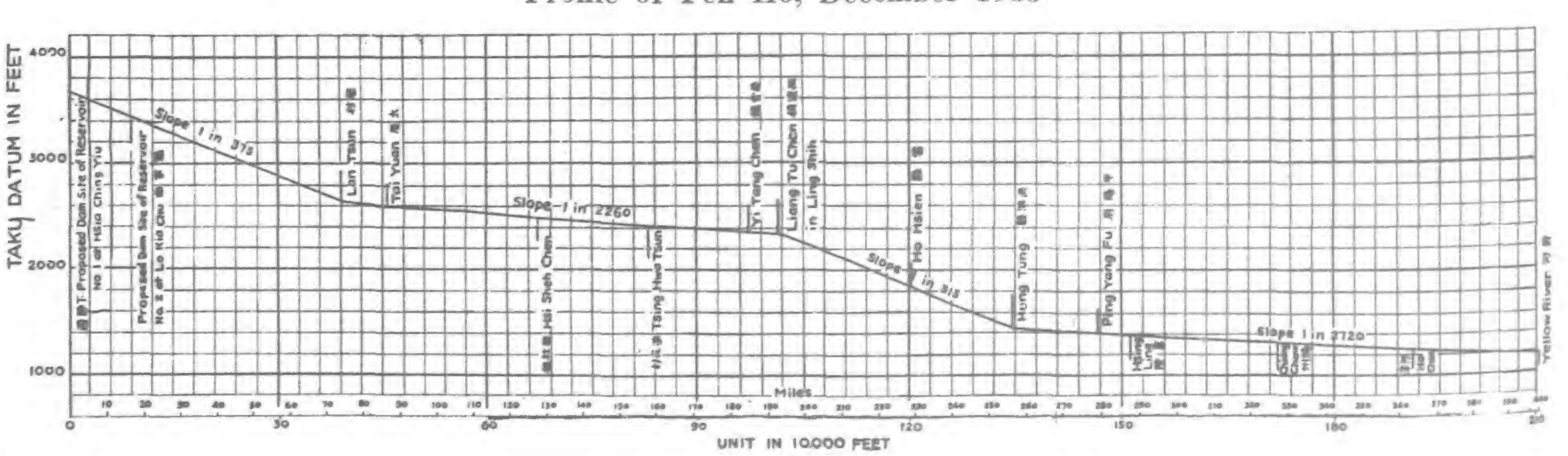


Plate III

records were also kept and other data borrowed from stations operated by other organizations. New gauges are being established in 1934 to more nearly cover the whole province.

By the close of the year most of the information required for this report was ready. More will be gathered in 1934 to supplement what is given here. This will, therefore, be considered a Preliminary Report on the Fen Ho. We are not at all satisfied with what we already know and we share with the engineers of the Mississippi River the feeling that every river has its own peculiar ways or characteristics that must be studied if one would know it well enough to properly deal with it.

As a basis for the plans and estimates contained in this report, field studies were carried out as noted below.

River Training

A topographical survey was made of that part of the Taiyuan plain most severely affected by floods in 1932, emphasis being laid on the Chiehsiu, Pingyao, Shao Yi and Fenyang areas. A narrower strip was covered by similar surveys following the river up to the head of the valley at Lantsun. Most of this was plotted in the field by plane-table method on a scale of 500 feet to the inch. These sheets were later reduced to a map on a scale of 1:96000. Five foot intervals between contours were used.

Reservoir Surveys

Capacity surveys were made of proposed storage reservoirs at Hsiachingyiu and at Lochiachu on the upper Fen Ho near Lo Fan in the early spring. Five foot contours were used, except for the higher levels where ten foot contours were taken. Topography was taken to a line 70 feet above river bed at the dam sites. Traverses were then made of the Fen Ho connecting these reservoirs with surveys in the Taiyuan plain.

Native well drilling outfits were used from late spring until the end of the year making test holes for bed rock at these two dam sites. The deep bed of sand, gravel and boulders, and the repeated freshets, made work slow by these native methods, but satisfactory results were obtained. Two of these drilling outfits were operated both day and night in order to get ample test holes drilled. Later a third outfit was employed.

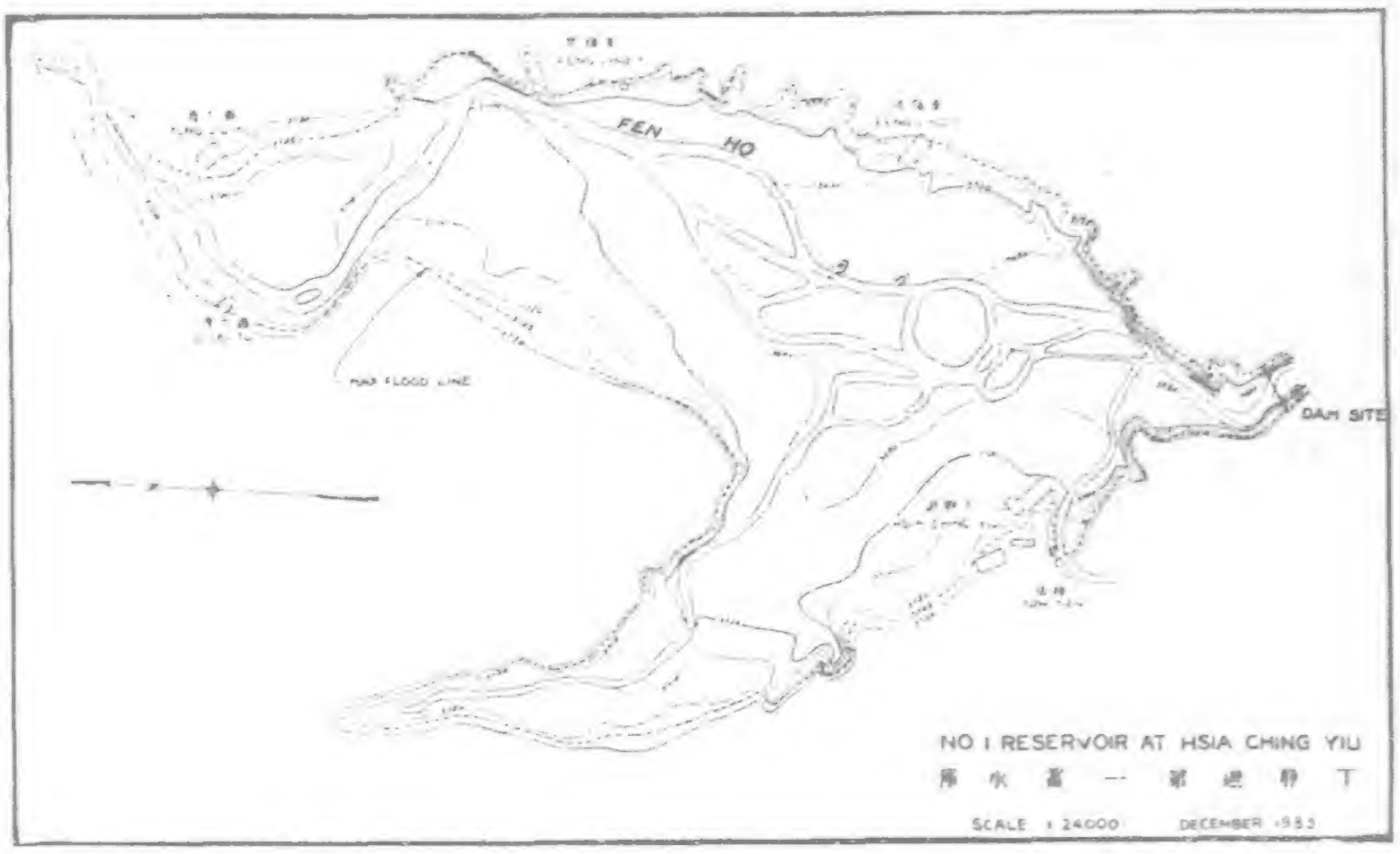
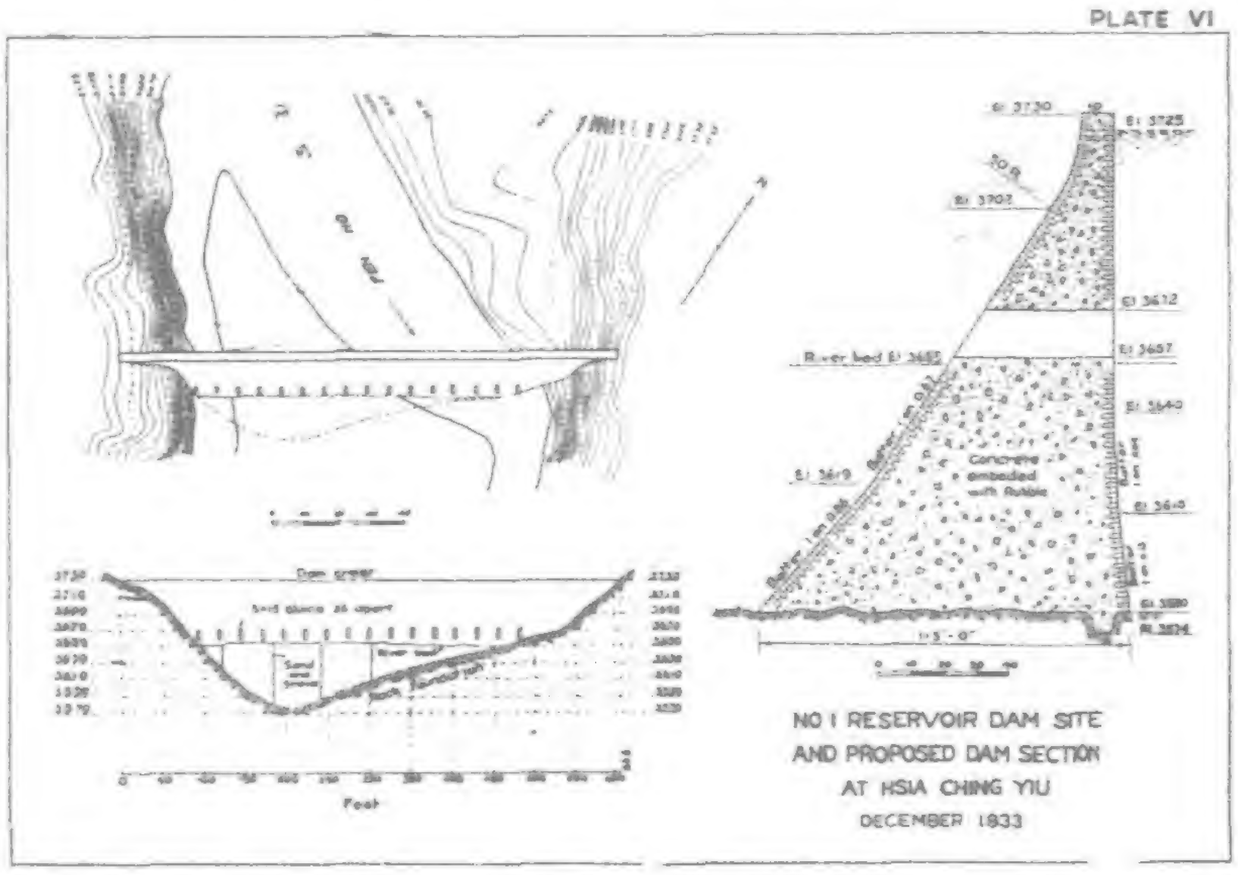


Plate V

Toward the end of the year topographical surveys were made of the proposed reservoir sites immediately below the two large springs at Kwang Sheng Ssu and Lung Tse Ssu, as well as the region near at hand that has been watered by these springs in past decades by ordinary flow. A similar survey of the Chintzu spring and tributary territory is being made. These three large springs are important feeders of the middle and lower Fen Ho and can supply stored water without silt to regions down river.

Early in the year surveys were also made of the upper Hsiao Sha Ho where topography was taken to get capacity for storage in three proposed reservoirs, though these seemed small. It was noted that this is one of the feeders to the Fen Ho that has considerable clear water flow in the winter and spring months.

Similar surveys were later made to get the capacity of a reservoir on the Wen Yu Ho. Two reconnaisance studies of this river were made earlier in the year. Though this is an important feeder of the Fen Ho, and carries comparatively clear water during the winter and spring, its reservoir sites are not attractive. Cost of storage per unit seems high as is also the case with the Hsiao Sha Ho.



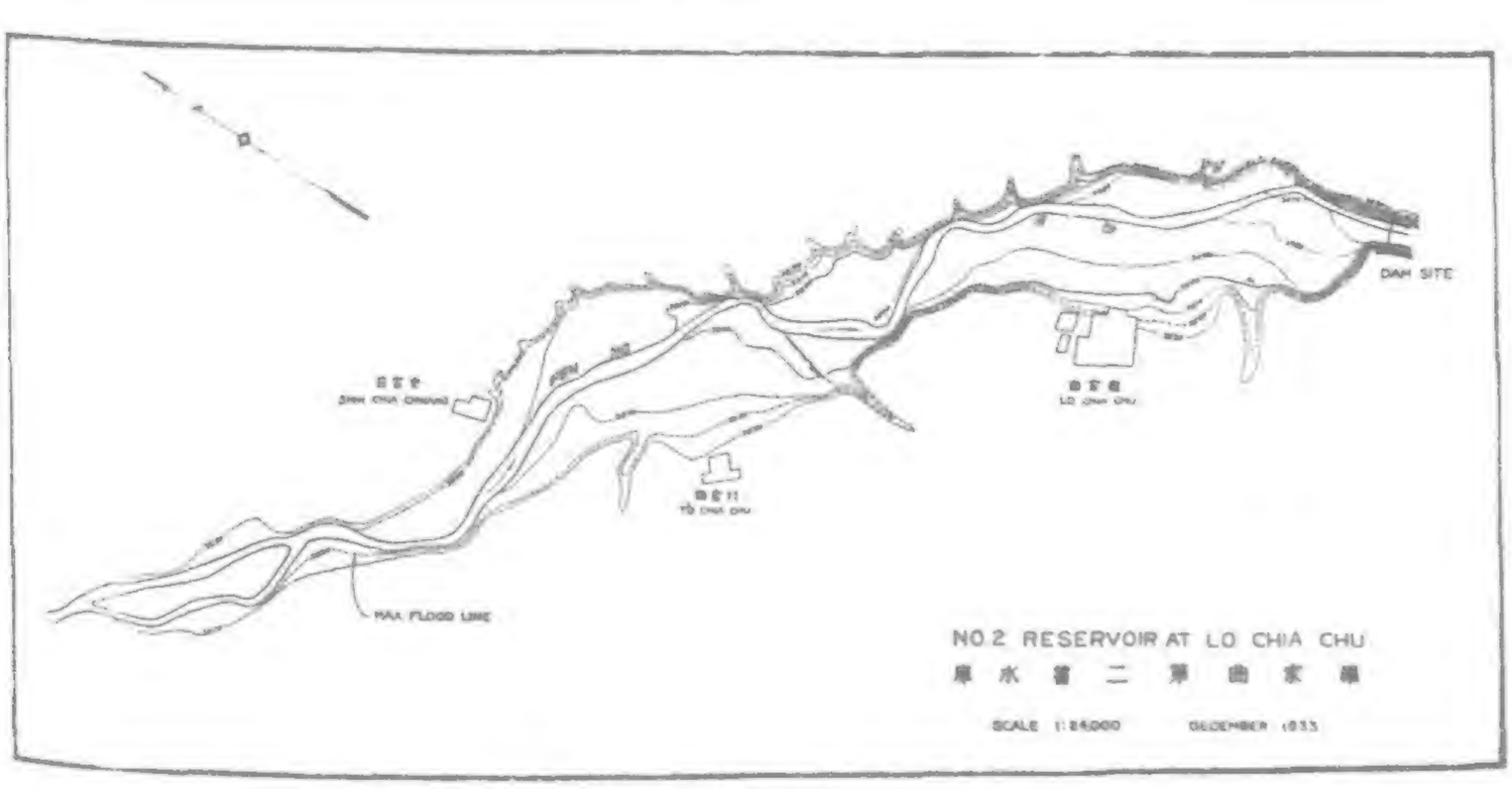


Plate VII

Levels and Bench Marks

Starting early in the year surveys were made connecting the corrected levels at the Taiyuanfu railway station with the upper Fen Ho reservoir site. From this point down stream checked levels were taken and Bench Marks were placed along the Fen Ho every mile to its junction with the Yellow River in south-west Shansi. This is the first such line of Bench Marks known to have been placed along any of Shansi's rivers. All reservoir studies and topographical surveys were tried to this system of levels. They are referred to Taku datum (Mean sea level at mouth of Hai Ho east of Tientsin).

Surveys of Various Irrigation Districts

In order to get the correct areas and to lay out improvements or extensions to existing

Flooded area north of Fenchow motor road, October, 1932

First survey party in field, February, 1933

irrigation systems, surveys were made of the Tung Li, Hsiang Ling Hsien, Chiangchow and Ho Tsin Districts. The last three named have been supplied with pumping plants built under the direction of Mr. L. H. Wang in 1930-31. The other district is supplied by ordinary flow from the Fen Ho, diverted in typical native way, by a low dam of short piles, brush, straw and stone, built each year in low water period. It has been proposed that a

of a series of three diversion dams that had been proposed by Mr. L. H. Wang in 1930, for getting Fen Ho water onto the adjacent lands in seven counties south of Taiyuanfu. He had built the first of these dams near Chingyuan in 1930-31. Our surveys this year show that the next one should be built about five miles west of Chi Hsien as indicated on Plate No. V. The third dam had already been located when these surveys started and has

Survey party on a three-day March from Shinchow to Upper Fen Ho Reservoir Site, February, 1933

The dam site at Hsiachingyiu on the Upper Fen Ho, February, 1933

low head masonry diversion dam be built for the Tung Li canal. Studies for such a dam are proceeding during the winter.

Diversion Dams in Taiyuan-Fenchow-Chiehsiu Valley

The topographical studies of the Taiyuan plain made it possible for our engineers to assist in locating Diversion Dam No. 2,

gone forward to completion during 1933 under the direction of the Reconstruction Bureau.

These three masonry dams or sluices will replace eight earthen dams that were rebuilt annually in former times to divert winter flow of the Fen Ho onto nearby lands, through a system of 20 canals. They are being built at an average cost of $150,000.00 each. Our engineers advised the greatest precautions in the placing

View of Taiyuan Plain from Kaoliang field near Lantsun

Fen Ho at medium stage below bridge near Taiyuanfu

of foundations and wingwalls for these structures, basing such advice on our 1933 observations of the rapid scour of this loess soil of which the Taiyuan plain is chiefly constituted.

Hydrographic and Silt Studies

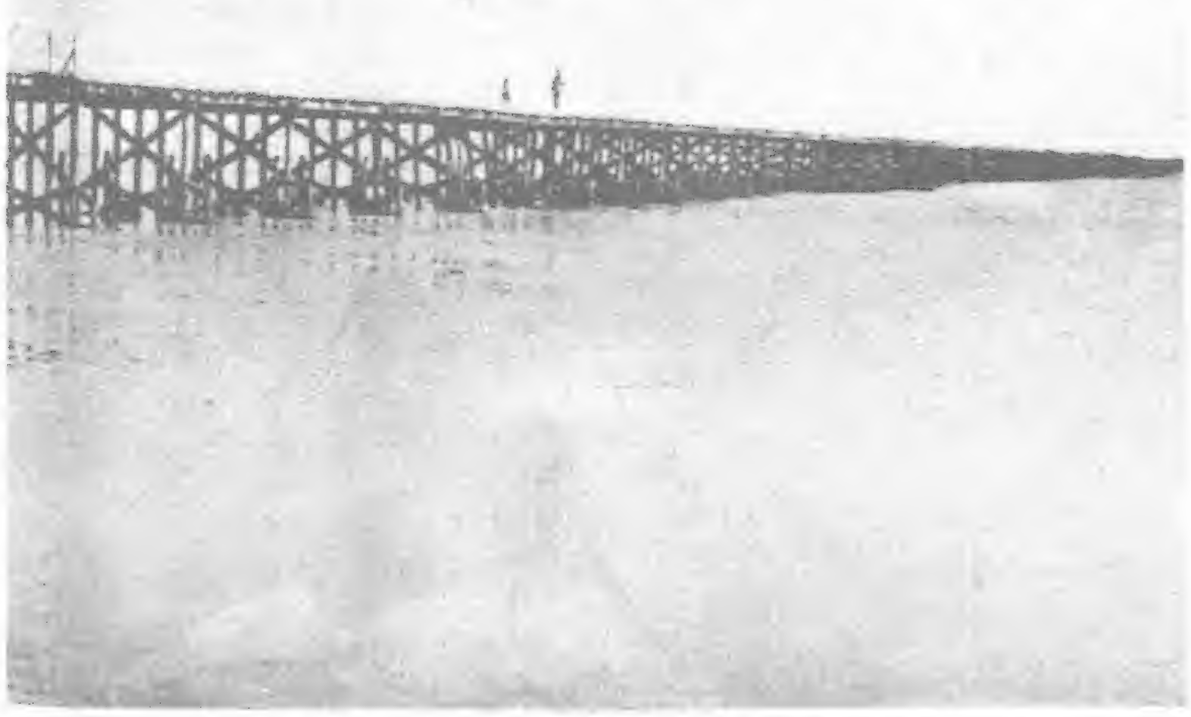
Commencing early in June systematic studies were made of the discharge and the silt content of the Fen Ho at Taiyuanfu. One graduate engineer was assigned especially to this task of making current meter gaugings of this River from the long bridge near Taiyuan once daily to the end of the year. On alternate days he took samples of the Fen Ho water at the same station and measured the solid content of these samples in our office laboratories. Also gaugings of the Fen Ho were taken by another party stationed at the head of the Taiyuan valley at Lantsun from June until the high water stage had passed, thus giving a check on measurements at Taiyuan bridge. The maximum flow recorded checks well with the maximum flow measured under direction of Mr. L. H. Wang in August, 1932, being a little over 87,000 second-feet. The maximum silt load in 1933 was found to be 23 per cent by weight.

Records of precipitation were kept in Taiyuanfu throughout the year. Similar records were kept at Hsiachingyao dam site, 85 miles up the Fen Ho. Other records were obtained from several stations in Shansi where gauges have been kept for several years.

(To be continued next month)

The Hsiang Ling Pumping Plant used to irrigate 18,000 mou of Fen Ho bottom Land

Crossing the Fen Ho at Chiang Chow



The bridge over the Fen Ho at Taiyuanfu

Where the Fen Ho leaves the Mountains near Lantsun

Small Pile and Fascine Groins protecting Earth Dikes on Fen Ho near Motor Road crossing East of Pingyao, July, 1924

Cleaning silt from entrance of a "Mud Canal" below Taiyuanfu bridge, Fen Ho

Construction Work on the Chuchow-Shaochow Section of the Canton-Hankow Railway*

By H. H. LING, Director and Engineer-in-Chief, Chu-Shao Section, Canton-Hankow Railway

THE Canton-Hankow Railway passing through the provinces of Hupeh, Hunan and Kwangtung is generally considered to be the most urgently needed railway in south China from political and economical points of view. The first movement for the construction of this line dated back as far as 1898. During subsequent years, construction work was carried on from both ends under separate organizations—the southern section being extended by the then Yueh Han (Canton-Hankow) Railway Company, with its headquarters in Canton, and the northern section by the Administration of the Hupeh-Hunan Section, with headquarters in Wuchang, financed by a British loan as a part of the Hukwang agreements.

World War Suspended Work

In the north a section from Wuchang (opposite Hankow) to Changsha was nearly completed, a distance of 368 kilometers (230 miles) and in the south a section from Canton to Shaochow (Shiuchow), a distance of 225 kilometers (140 miles) when the World War broke out, thus interrupting the extension from both ends, leaving a gap of about 452 kilometers (281 miles) unfinished. These two sections have been put into operation since their completion. The northern section (Wuchang-Changsha) is operated often at a loss on account of serious water competition, while the southern section (Canton-Shaochow), although slightly better than the other, is also badly affected by river transportation and hardly able to maintain itself. Thus the delay of many years in the completion of this important trunk line not only hinders political unification and economic development of the nation, but also makes it exceedingly difficult for the two short sections to struggle for their very existence.

Among other reasons, the lack of a financial scheme for the completion of the whole line is perhaps the most important one for the long suspension of work since it was stopped nearly twenty years ago. The amount needed for the remaining 452 kilometers is by no means small and unless funds are sufficient for completion once for ever, no one sees much use in having short extensions from time to time.

Work Resumed in 1929

The Ministry of Railways lost no time in ordering the resumption of construction work in 1929 when the negotiation for the return of the British portion of the Boxer Indemnity to be used for construction and educational purposes was already on foot. Consequently an office was established in Canton, known as the Chushao (Chuchow-Shaochow) Section Construction Office, in the latter part of 1929, with the function of construction of the gap section to be in charge of a Director who was to be also the Engineer-in-Chief. A part of the Belgian Boxer Fund was first secured by the Railway Ministry resulting in the purchase of rails, bridges, etc., and a certain amount of rolling stock from Belgium for a section from Shaochow to Lochang, a distance of 51 kilometers. Besides funds available for materials, the Chushao office was further financed by the Southern Section Administration to the extent of $100,000 per month out of its receipts to meet labor and local material expenses. With a certain portion of work already started prior to 1915, construction of this section was resumed in the latter part of 1929 with a good start. Unfortunately, funds became gradually scarce, and work could go on only slowly until the summer of 1932, when work was practically all suspended again. In the meantime, the negotiation between the Ministry of Railways and the Sino-British Boxer Fund Board for a loan sufficient to complete the Canton-Hankow Railway had made much progress, and pending final settlement of the agreements, an advance of $700,000 was made in October, 1932, and the work of this Shao-Lo section was again resumed until its completion in September, 1933, when this section was handed over to the Southern Section Administration for operation.

The newly completed Shaochow-Lochang section has a length of 51 kilometers joining the two prosperous cities on the east bank of the North River. There is a tunnel of 426 meters (1,400 feet) long, the construction of which was started in 1910, and up to the time of interruption of work, a portion of 215 feet at the north end and 560 feet at the south had already been driven. The tunnel goes through soft rock strata and has full concrete linings. The major bridges in this section include the Shaochow Bridge, spanning over the Nan Hsiung River, having one 60 meter through truss, five 30 meter, one 18 meter and one 10 meter girders. Rails in this section are 43 kg. Chinese Government Standard Sections, 10 meters in length. Australian and Siam hardwood sleepers were used in this section on account of their readiness besides being free from white ant attack. Australian hardwood sleepers (9-in. by 5-in. by 8-ft. 0-in.) were 5/3d per piece, c.i.f. Hongkong, and Siam sleepers of various names (8-in. by 6-in. by 8-ft. 0-in.) from $3.50 to $4.42 Hongkong currency a piece, c.i.f. Hongkong. Local cement manufactured by the Sai Chuan Cement Works in Canton was first introduced, but on account of its high cost ($10.50 small coins per barrel) Haiphong Dragon Brand cement and Chee Hsin Cement were also used.

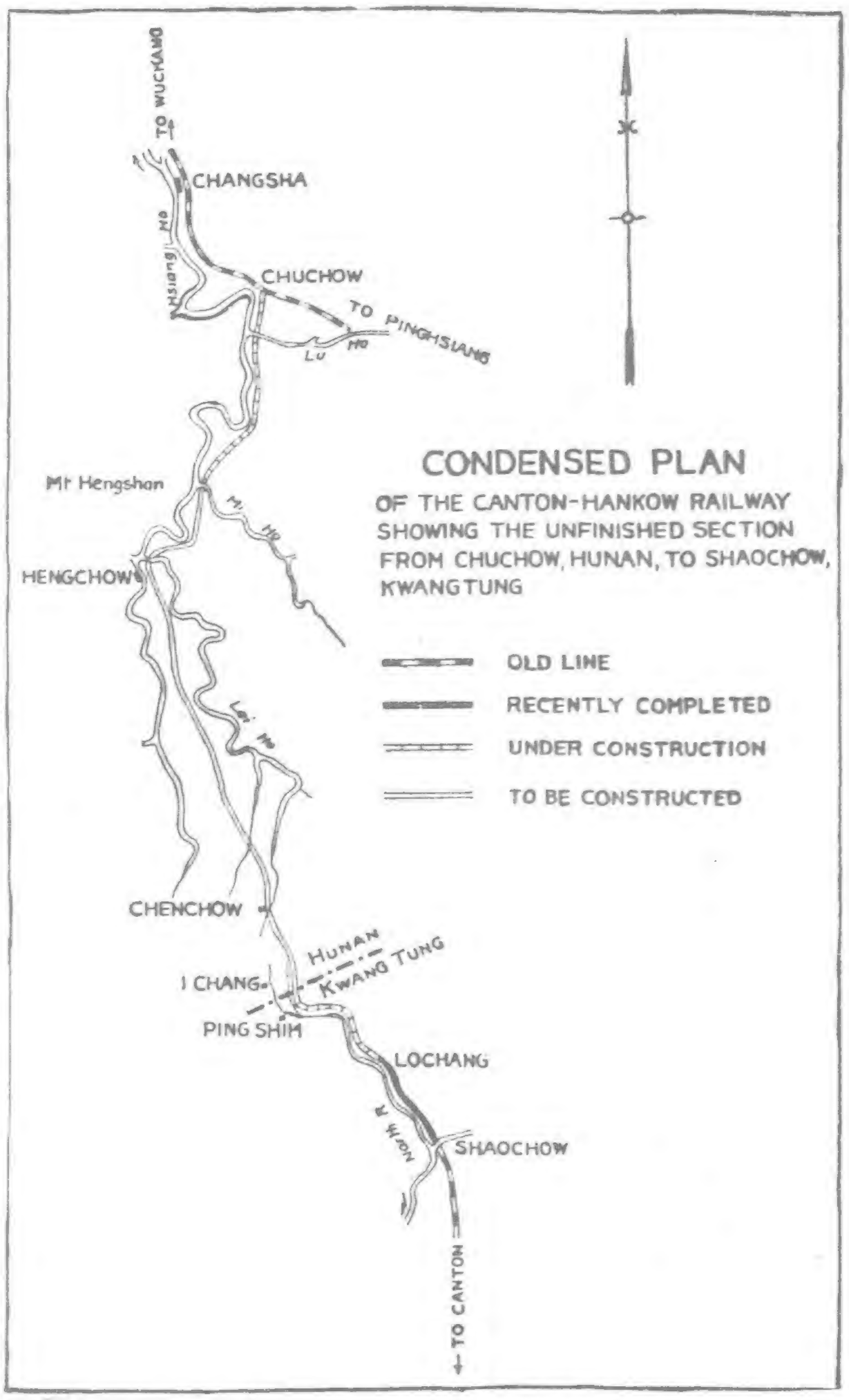
Scenic Upper Course of the North River on the East Bank of which lies the Canton-Hankow Railway

**Journal of the Association of Chinese and American Engineers.*

Boxer Fund Appropriations

On July 18, 1933, the Ministry of Railways and the Sino-British Board Administering the Boxer Funds concluded a loan agreement in which the Board consented to appropriate to the Ministry of Railways out of two-thirds of the total fund designated for railroad purposes the following portions for the completion of the Canton-Hankow Railway : (*a*) For purchase of materials in England, through the Chinese Government Purchasing Commission in London, £920,000 in cash and £740,000 in instalments from March, 1933, to December, 1936. (*b*) For work and local materials in China, £740,000 in instalments during the period of construction, from March, 1933, to December, 1936, £500,000 to be redeemed prior to 1937 from previous loans made to the Ministry of Railways, and £1,600,000 in instalments from January, 1937, to December, 1946. As this last-mentioned portion is not available during the construction period, it is further agreed that the Ministry will issue bonds amounting to £1,200,000 over a period of four years with these future instalments as securities.

It is estimated from the above portions of the funds available, the Ministry of Railways will be able to realize £1,660,000 for purchasing foreign materials and $31,966,000 for work and native materials in the course of four years besides interest on the capital to be paid as set forth in the loan agreements. This is all that can be made available out of the two-thirds of the total British Boxer Fund appropriated for railway purposes. By comparison of these amounts with the estimates on actual construction requirements, it will be seen that the sum of £1,660,000 for foreign materials is about what will be needed, but the amount for work and native materials, according to the writer's calculations, will be short by about $3,500,000. This must be made up by the Ministry of Railways.



Work in Progress as Funds Available

Having known that the loan agreement was to be concluded soon, and before the Shaochow-Lochang section was finished, the construction office in Canton had already made preparations for a further extension of 62 kilometers from Lochang to the provincial border. This section of the line is perhaps the most difficult of all, following the upper course of the North River necessitating heavy rock cutting, tunnelling and construction of extensive retaining walls. The original location of this section made by engineers of Yueh Han Railway Co. in 1913, required some sixty tunnels. Subsequent studies have made many improvements, and the line now adopted was located by Mr. Y. C. Lee, the present District Engineer, placing the line further out along the river, thus greatly diminishing the amount of protection work. Following closely the North River, the line has more than 60 per cent of curves, the maximum curvature being 7°-30′ (100 feet chord, equivalent to about 5° of 20 meter chord). As the line follows the river valley, the grade is rather gentle with a maximum of 0.7 per cent.

Tenders for the construction of five tunnels, the longest of which is 750 feet in length, and for 2,300,000 cu. m. of earth and rock cutting, together with a large number of retaining walls, altogether to cost about $3,500,000, were called for in May, 1933. Later on, different contracts were awarded and various works started in the first part of July. Further contracts were awarded for bridges and culverts. Tenders for two more tunnels, one 750 feet and the other 150 feet long, were invited in January, 1934, together with a certain amount of earth and rock cutting. The work in this whole section of 62 kilometers will eventually involve an expenditure of over seven million dollars not including foreign materials.

One of the many tunnels under construction

The Famous "Golden Chicken Hills" along which the Canton-Hankow Railway passes

A 750 foot Tunnel through hard rock

Boring plant in action on the Lo Ho Crossing 10 miles South of Chuchow

This district of 62 kilometers is divided into four sections each under the charge of a section engineer, while the district engineer also takes one section with the district's office in Lochang. The construction of this district is very much handicapped by the inconvenience of transportation. For, beyond Lochang, the North River goes into deep gorges which link up with mountain ranges which have only broken paths on the steep hill-sides close to the river. The river is extremely shallow in dry seasons, and within 40 kilometers north of Lochang, there are no less than 18 rapids. Small boats with a draft of 18 inches can scarcely go over these rapids and oftentimes meet with disaster. Thus it makes transportation of men and material exceedingly difficult, by land or by water. As the nature of the work requires a great deal of hand labor, it is estimated that no less than 15,000 men should be employed. This constitutes another difficult problem to the contractor for he must hire laborers from Hunan and provide for them lodging places and ample food supply.

The rock formation is mainly composed of good limestone, either exposed or covered with a few feet of earth. Most of the rock cutting is facilitated by air compressor sets and dynamite. On account of the steep natural slope along the river, making the transportation of these machines exceedingly difficult, only portable compressors of light weight can be used to advantage. Air compressors of various makes, including Ingersoll Rand and Belgian and German products are now in use by the contractors. In many instances, these compressors are mounted on small boats moving up and down the river to places where their service is needed.

Although engineers in this section are doing a piece of difficult and painstaking work, yet they are to be envied for the beautiful country in which they stay. For this section lies all along the bank of the North River with deep gorges, rapids, forests, waterfalls and rock caves, a beautiful landscape. The accompanying illustrations show a few of the picturesque spots.

Work Started from Both Ends

The Chushao Construction Office had already made all preparations to start work also from the north end before the loan agreement was signed in July, 1933, and in September, 1933, the Head Office was moved from Canton, Kwangtung, to Hengchow, Hunan, somewhat centrally located in order to be in closer touch with the two ends. Since July, 1933, after the settlement for the appropriation of funds, the Chushao Office has been able to map out the 4-year plan for the completion of this important line. The accompanying table shows the plan of the progress of the work in the course of four years beginning from July, 1933.

FOUR YEAR PLAN FOR THE COMPLETION OF THE CANTON-HANKOW RAILWAY FROM JULY, 1933, TO JUNE, 1937, FOR A LENGTH OF 401 KM.

Districts		*1933*	*1934*	*1935*	*1936*	*1937*
		(A) Main Track-work		(B) Ballasting and Buildings		
No. 2. Lochang-Prov. Border	62 km.					
3. Prov. Border-Tanling	48 ,,		(A)		(B)	
4. Tanling-Kaoting	56 ,,			(A)		(B)
5. Kungping Kwanyin-chao	74 ,,			(A)	(B)	
6. Kwanyin-chao-Luichi	74 ,,			(A)	(B)	
7. Luichi-Chuchow	87 ,,		(A)		(B)	

Small boats going over the Rapids

On the North River

The section of 16 kilometers from Chuchow to Lokow in the northern end, built some years ago but never operated, is now being remodelled by raising the embankments and masonry structures and improving the grade. In the Northern section, there are three major bridges over the Lo Ho, Mi Ho and Lei Ho, all tributary to the Hsiang Ho. Borings on these sites were started before, and are now being further continued to obtain more information on foundations. On account of lack of cheap land transportation facilities and the possibility of navigation on the Hsiang Ho up to as far as Hengchow for several months of the year, work will be started from Lokow and Henchow at the same time towards the south in order to gain time.

1,400-foot Tunnel between Shaochow and Lochang

Pro-Cast Concrete Blocks being made for Tunnel Linings

Maximum Gradient

As the section of the line from Chuchow south to the Canton border was located first by British engineers in early years and again relocated by Mr. C. J. Carroll, Chief Engineer of the I-Kwei line, location parties are now driving down the final stakes ready for work. It will be noted that early location used 1 per cent maximum gradient, and Mr. Carroll used .7 per cent maximum grade in his relocation. Much greater diversity of opinion on maximum grades is manifested on the mountainous section over the provincial boundary for a distance of about 60 kilometers. Several surveys were run during early years, and among other proposed lines involving some prohibitive costs, the one known as the Dees' Line seems to have received more attention. Mr. Dees, a British engineer of the Hupeh-Hunan Section, located the line in 1913, following the Pei Sha Creek with 1 per cent as maximum gradient. In 1931, two surveying parties were sent out for comparative studies by going along the Tien Tow Creek valley instead of Pei Sha, and by using .7 per cent maximum grade instead of 1 per cent. The results of these surveys revealed the necessity of sharp and long curves, heavy support and protection, much greater lengths and greater cost of construction.

As the question of maximum gradient should be treated with the whole railway line as an objective and not as one of local nature, the construction office proposed to the Ministry of Railways early in 1933, to have a joint conference of the three sections of the line (Canton-Shaochow, Hupeh-Hunan and Chushao) to discuss this question as well as other important technical problems common to them all. Consequently a joint conference was held in Nanking in May, 1933, under the auspices of the Ministry of Railways, and among other questions, it was decided that .7 per cent maximum grade and curvature of 300 meters radius should be limited for the section from Chuchow to Chenchow, and that maximum grade of 1.5 per cent with compensation and sharper curvature may be allowed for the section from Chenchow to Lochang when necessary, subject to the approval of the Ministry of Railways. It will be noted here that maximum grade of the present Canton-Lochang section is .7 per cent and that of the Wüchang-Chuchow Section going over comparatively easy country is 1 per cent. Location surveys over this difficult section are now completed for a line following partly the Dees' line with broken 1 per cent grades without compensation on both sides of the divide all within a distance of 20 kilometers just north of the provincial border. For the sake of careful comparison in view of the importance of the

(Continued on page 186)

Air Compressor mounted on boats being used in rock cutting

Boring on the Chao Ling Ho Bridge Site

The Use of Nickel Alloy Steels in Japan

By JAMES A. RABBITT, Adviser to the Japan Nickel Information Bureau

Foreword By Dr. SABURO WATANABE, President Japanese Special Steel Company

PART ONE

In 1931, Mr. James A. Rabbitt gave a course of lectures on Nickel Alloys at the Imperial University at Sendai, in which he drew attention to the great amount of research work done by Japanese scientists, but he pointed out at the same time that the industries of the country had not, in the use of alloys, kept pace with this advance in research.

Since that time, there has been a decided increase in the use of alloys throughout the industries of this country, and now Mr. Rabbitt has added one more link to bridge the gap between science and industry by compiling this book on the modern uses of nickel alloy steels.

The arrangement is in logical sequence, starting with the uses of nickel alloy steels in Japan and the production forms, attributes of nickel alloy steels, general uses and finally particular uses in various industries, given in alphabetical order from aircraft to road-building.

The data is presented on the basis of the economy of using alloy steels to meet the demand for greater strength and toughness, lighter weight for modern high speed equipment, or for heat and corrosion-resistance, as the case may require.

The applications cited throughout the book are the most modern, and I recommend this book as important to fill a great need in assisting our industrialists and engineerse to keep pace with this age of alloys.

* * *

JAPAN'S lack of mineral resources has been accepted by many people as a standing challenge to the country's industrial growth. As a result of this condition, pessimists have predicted that Japan could not succeed in the production of iron and steel sufficient to meet the demands of its ever increasing industries.

Notwithstanding this lack, Japan increased its production of pig iron 225 per cent between the years 1920 and 1930, and also increased its production of steel to 2,225,900 metric tons in 1930, which is an increase of 490 per cent over the 1920 production.

An even greater increase in production to 3,704,869 metric tons during the first eight months of 1933 is indicative of the rapid strides which Japan is making toward self-sufficiency.

The imports of steel, which amounted to 1,154,402 tons in 1924 were reduced to 371,706 tons in 1930, whilst the exports have reached nearly 100,000 tons. Certainly this is a creditable performance and should suggest Japan's future greatness in steel production. The imports of special shapes for the first nine months of 1933 were equal to 235,129 metric tons on a rapidly declining scale.

The total production value of all Japanese industries compared to the total production value of industries in the United States of America were in 1929 in the ratio of 1 to 20, while the comparative production value of pig iron during the same period between the two countries was 1 to 21 and steel, 1 to 23.6. This indicates that the production of iron and steel had, in comparison with the United States of America, advanced proportionately with Japan's progress in general industry.

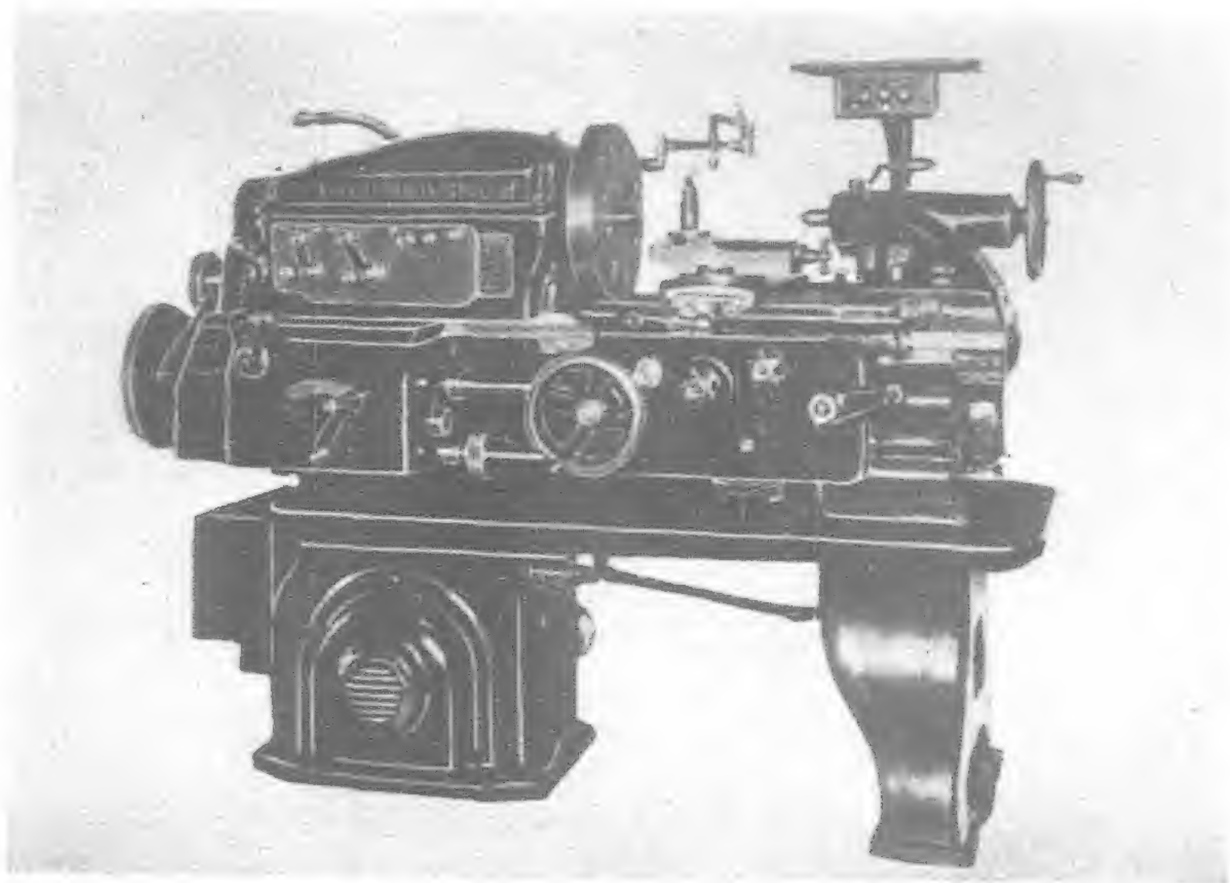


Fig. 2.—10-in. by 4-ft. 0-in. (254 by 1219 mm.) Heavy Duty Tool Room Lathe, manufactured by Roku Shoten. Gears of Case-Hardened Nickel-Chromium Steel

Fig. 1.—21-in. (533 mm.) All geared upright drill, made by Roku Roku Shoten. Gears of Case-Hardened Nickel-Chromium Steel

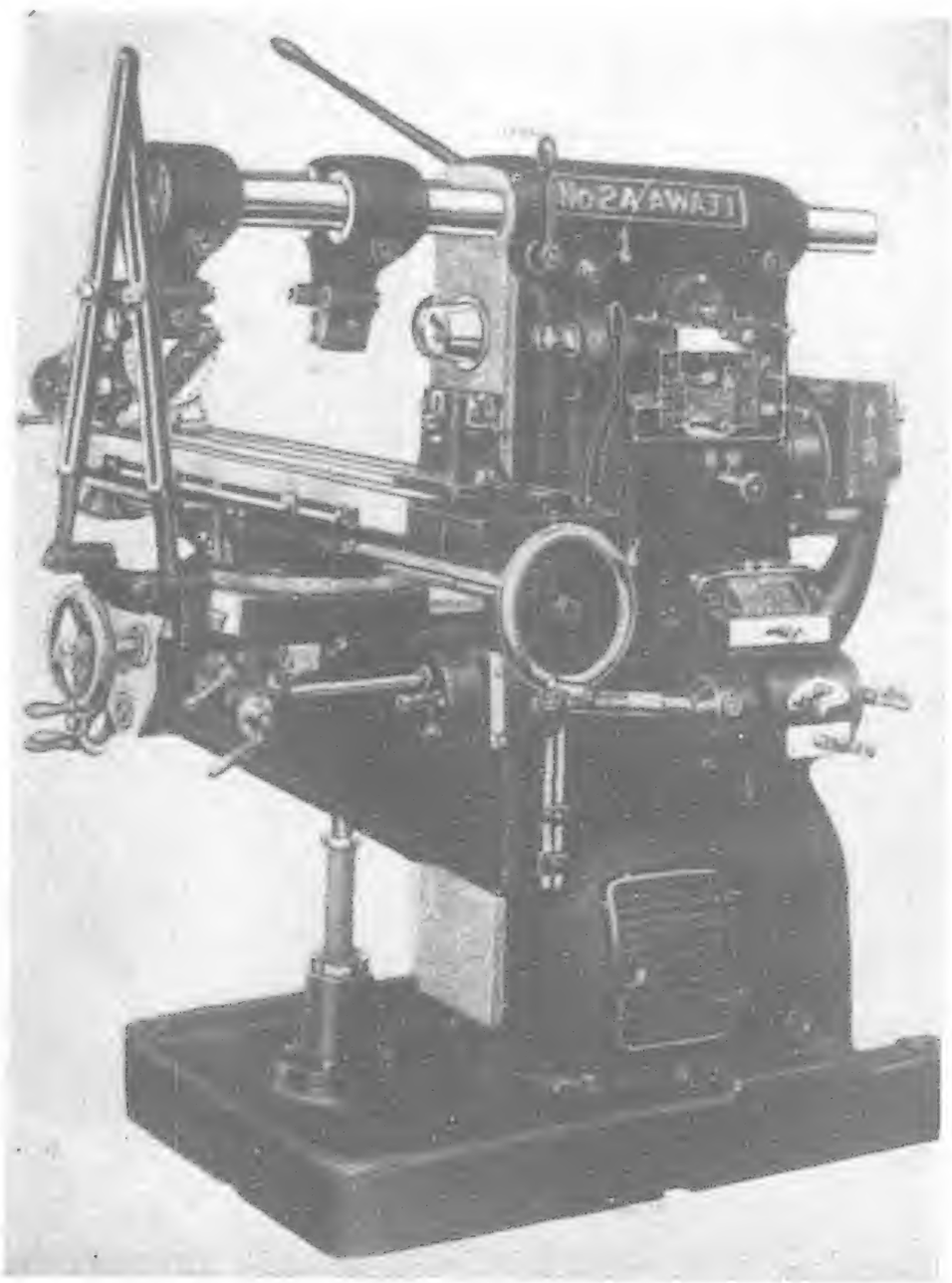


Fig. 3.—Universal Milling Machine. Spindle and gears are made of Nickel-Chromium Steel. Manufactured by Awaji Iron Works, Tokyo

Alloy Steels in Japan

There was, up to 1930, one notable exception in this otherwise constant progress, and that was in

the production of the all-important alloy steels which form the basis of modern industrial development. In this field Japanese production as compared to that of the United States was in 1929 as 1 to 196. Since the establishment of the Japan Nickel Information Bureau there has been an extraordinary development in the use of nickel alloys throughout the industries of this country. All industries of Japan are now giving great consideration to the quality of their materials. In 1930 the total production of alloy steels was 8,000 tons. This jumped to 18,000 tons in 1931, and to 24,000 tons in 1932. During the first eight months of 1933 the production of alloy steels in Japan indicated that the year's production would approximate 40,000 tons.

The use of correct alloys forms the very basis of industrial rationalization, if "rationalization" means approaching an industrial problem intelligently. The demand for higher speeds, higher stresses, lighter weights and longer life for parts required for locomotives, automobiles, aeroplanes, and speed boats during the World War brought the establishment of nickel as the most soluble of metals with the ability of not only imparting its own superior qualities to whatever it entered into combination with, but also of raising the quality of the baser metals with which it is alloyed. As Dr. Kamo has so aptly said: "Nickel is to industry as salt is to food."

The solubility of nickel with other metals is like that of sugar in water. Its presence, when added to other metals in various proportions, imparts new properties so that alloys are obtained which are suitable for almost any need. In some cases, there is need only for an increase of strength; in others, toughness is required; while in others it may be necessary to provide resistance to corrosion, or provision must be made for all three of these properties combined, or again beauty of appearance may be the main factor required. In any event, the metallurgist, like the physician with his remedies, writes a prescription to meet the individual case. The pictures shown herewith are typical of the many practical applications of nickel alloy steels on Japan.

The List of Nickel Alloy Steel Makers in Japan follows:

Daido Denki Seikosho, Nagoya.
Imperial Steel Works, Yawata.
Kansai Denki Chukosho, Osaka.
Kawasaki Rolling Stock Mfg. Co., Kobe.
Kobe Steel Works, Kobe.
Komatsu Iron & Steel Mfg. Co., Komatsu.
Kurimoto Iron Works, Osaka.
Mitsubishi Ship Building Co., Nagasaki.
Nippon Casting Co., Yokohama.
Nippon Chuko Kabushiki Kaisha, Tokyo.
Nippon Jokiko Steel Works, Amagasaki.
Nippon Metal Engineering Co., Tokyo.
Nippon Special Steel Co., Tokyo.
Nippon Steel Works, Tokyo.
Oriental Alloy Metal Works, Osaka.
Special Steel Mfg. Co., Tokyo.
Sumitomo Steel Works, Osaka.
Taika Tool Mfg. Co., Dairen.
Tokyo Kozai Kabushiki Kaisha, Tokyo.
Yasuki Steel Works, Yasuki-machi, Shimane-ken.
Yonago Steel Works, Yonago, Tottori-ken.

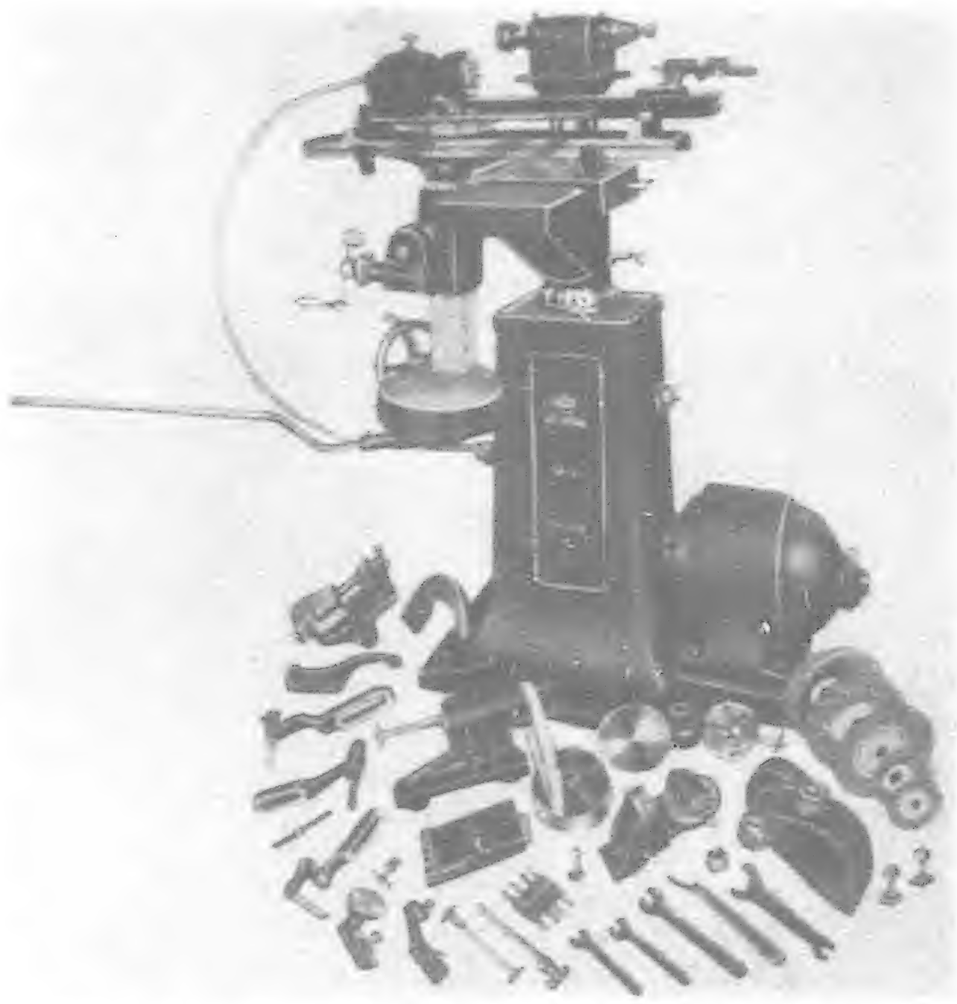


Fig. 4.—Universal Tool and cutter grinding machine. Spindle and gears made of Nickel-Chromium Steel. Manufactured by Awaji Iron Works

Nickel Alloy Steel Castings

Lower costs and a better product are of vital importance to manufacturers at all times. For this reason the users of steel castings are showing interest in the improvements, with the addition of small quantities of nickel, by which stronger and tougher castings can be obtained.

Ordinary steel castings, though superior to those made of iron, are still far from being satisfactory, because they are relatively weak and have a low shock and fatigue resistance. These conditions are improved to some extent by annealing and still more by a regular heat treatment, but the best results are to be obtained with a heat-treated casting made of nickel alloy steel. Strictly speaking, alloy steel castings have been known for a long time, but it was not until the end of the Meiji period (1912) that the demand increased, largely to meet the requirements of the Government departments. The World War increased the uses of steel castings tremendously, the increased tonnage being mostly for alloy steel castings. The result has been that the use of these alloy steel castings has now become firmly established in the market. Such castings are made principally by the addition of nickel and chromium, and to some extent vanadium, and to a still lesser extent molybdenum.

The composition ranges for nickel alloy steel castings most commonly used are shown in Table I.

TABLE I.

	3% Ni Steel	*Ni-Cr Steel*	*Ni-Mn Steel*
C	As desired	As desired	As desired
Mn	0.40–0.70	0.40–0.70	0.90–1.50
Si	0.15–0.40	0.15–0.40	0.15–0.40
P	Below 0.05	Below 0.05	Below 0.05
S	Below 0.05	Below 0.05	Below 0.05
Ni	2.50–3.50	1.50–2.50	1.20–1.75
Cr	—	0.50–1.25	—

The analyses given in Table I are intended only as a rough guide because in practice they must vary in accordance with the kind of service for which the casting is intended. This is particularly true of the carbon content which usually ranges from 0.25 to 0.35 per cent. Where great strength or hardness is required, the carbon content will be higher. Where ductility and toughness are the main requirements, the carbon content may be lower. The real economy in the use of nickel alloy steel castings cannot be measured always by the first cost in yen and sen. There is always the element of reputation to be gained by the use of high grade castings, and also the financial saving resulting from economy in weight. The modern method is to eliminate bulky castings and to substitute strong, tough and shock resisting castings with no excess dead weight.

Nickel and nickel chromium steel castings are so much stronger than ordinary carbon steel castings that for the great majority of purposes a saving of 40 per cent in the weight of the castings may be obtained. Under such circumstances, there may be a saving in total cost of about 10 per cent, even after allowing for an increased cost of the nickel alloy steel by weight and for its heat treatment. Of course there are many other economies which result from savings on freight and by eliminating savings on freight and the elimination of repairs.

To give the cost in a typical case, a cast low-carbon steel gear weighing 33 kg. costs 22 sen per kg. If it is made of nickel-chromium steel, it will cost 27.5 sen per kg., or an increase of 25 per cent, for a product that will have at least double the strength. As previously stated, it is often possible to reduce the weight of such castings as much as 40 per cent. In such a case, the increased price of 25 per cent will be more than offset by the saving in weight.

Castings Replace Forgings

The increase in the use of nickel alloy steel castings is the result of the satisfaction given by the exceptional qualities of forged steel. By gradual use and improvements, steel casting work has

been developed to a point where in many cases the nickel alloy steel castings may now be used instead of steel forgings. A good sound nickel alloy casting is often superior to a forging. Dr. Giolitti, in his interesting book,* mentions several cases of heat-treated 2 per cent nickel steel castings which were used satisfactorily as a substitute for expensive forgings in war material for the Italian army.

Agricultural Applications.—In agricultural machines, especially in tractor parts, such as shoes, drive sprockets, track chains and track parts, nickel-chromium steel is used to a great extent. A typical case given by one manufacturer of tractor shoes is as follows: With nickel-chromium steel, analyzing—carbon, 0.35 per cent; nickel 1.00 per cent: and chromium, 0.60 per cent, after an air quench and draw, the elastic limit is 69 kg/mm, ultimate tensile strength 88 kg/mm, elongation 16.5 per cent and reduction of area 38 per cent, with a Brinell hardness of 222.

Automotive Applications.—The superior quality of nickel alloy steel castings has been responsible for their introduction into the automobile field where such parts as axle housings, differential spiders, spring hangers, brackets and other small parts carrying heavy loads are frequently cast from nickel alloy steel. Even the connecting rods and the front axles have been made with nickel alloy castings although stiffness rather than strength is the controlling factor in selecting material for such parts.

Locomotive Applications.—There is a considerable use of nickel alloy steel in transportation equipment. The use of nickel cast alloy steel in the frames of the modern locomotives has resulted in a great reduction in weight, which is a very important factor owing to the necessity of enlargening the modern locomotive to haul heavy loads. This is particularly important in Japan where narrow gauge tracks are still in use. The success of nickel alloy steel in locomotive frames is due to the extraordinary toughness and resistance to impact of low carbon 2 per cent nickel steel combined with strength in excess of that developed by carbon steel.

When containing only 0.18 per cent of carbon, 2 per cent nickel steel, such locomotive frames have the following physical properties:

Ultimate Tensile Strength	55 kg/mm
Yield Point	34 kg/mm
Elastic Ratio	61.0 per cent
Elongation in 50 mm.	30.4 „ „
Reduction of Area	55.8 „ „
Brinell Hardness	145
Izod Impact Value	7.2 kg m

In locomotive construction, the high strength of the nickel steel mentioned above, has caused it to be used also for castings other than for frames, such as for wheel centers, cylinder castings, brackets, driving boxes, etc. By the use of nickel alloy steel, the sections of such castings have been reduced in weight and area by 15 per cent because of the great strength of this material. The net result of the use of nickel alloy steel for these castings has been to obtain a stronger casting with less weight at practically the same price as the heavier carbon steel castings. Cast nickel chromium steel has been successfully used for railroad work where the conditions are especially severe, such as in the construction of switch frogs and cross-overs which are subjected to constant repetition of pounding wheels.

Fig. 5.—Universal Grinding Machine. Spindle and gears made of Nickel-Chromium Steel. Manufactured by Awaji Iron Works, Tokyo

Nickel Alloy Steel Forgings

Large forgings constitute an important and constantly increasing field for alloy steel. The elements used in forging steels are nickel, chromium, molybdenum and vanadium. Each, added by itself, confers certain properties on steel. By a combination of one or more of these elements, where each complements the other, it is possible to produce properties not obtainable by the addition of any one element alone.

Nickel is added to steel primarily to obtain increased strength with toughness. When

* Giolitti, F., "Heat Treatment of Soft and Medium Steels." McGraw-Hill Book Co., 1921, p. 242.

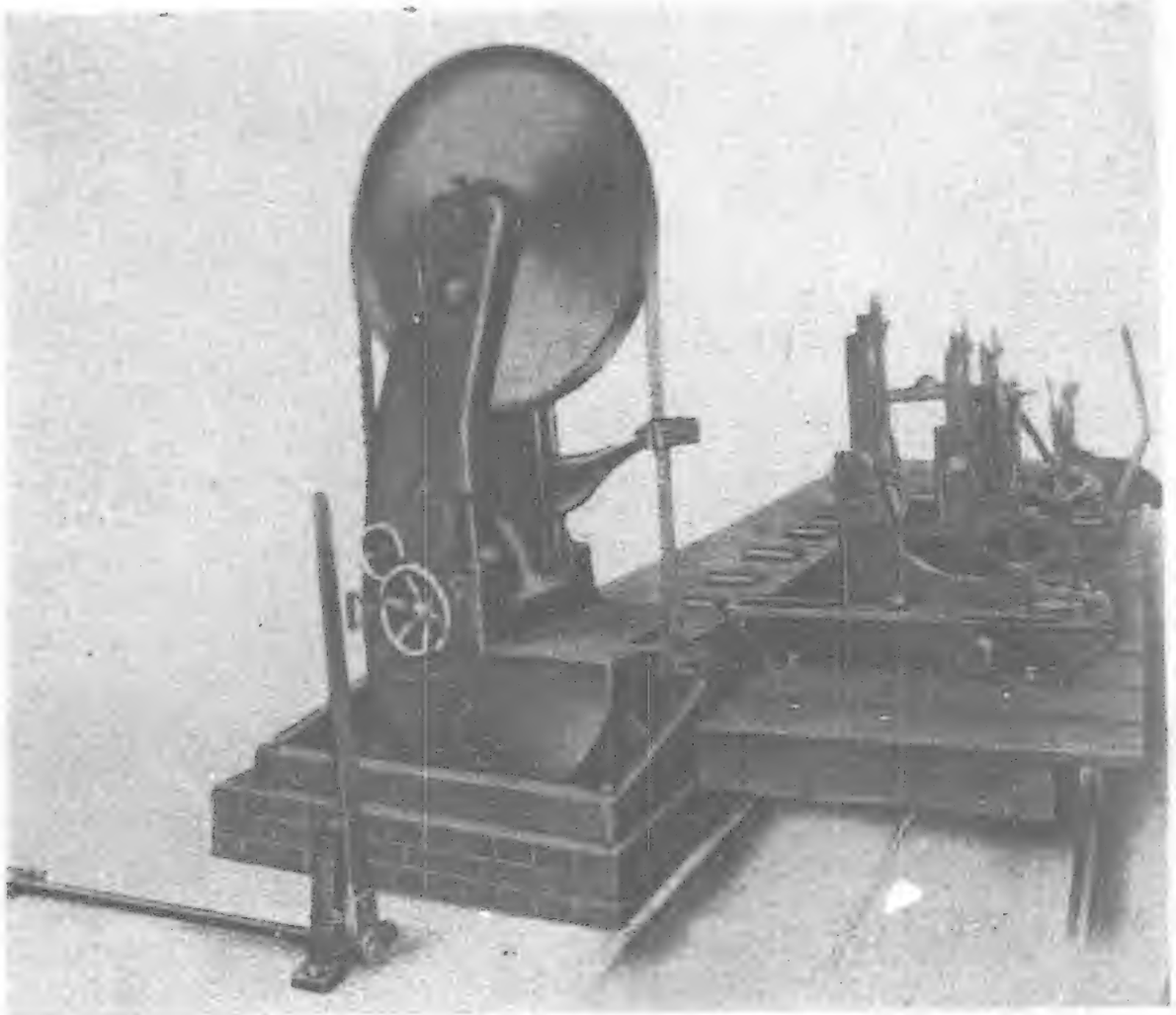


Fig. 6.—Band Saw. Shaft made of Nickel-Chromium Steel. Manufactured by Kikukawa Engineering Works (Ohminato Miyeken)

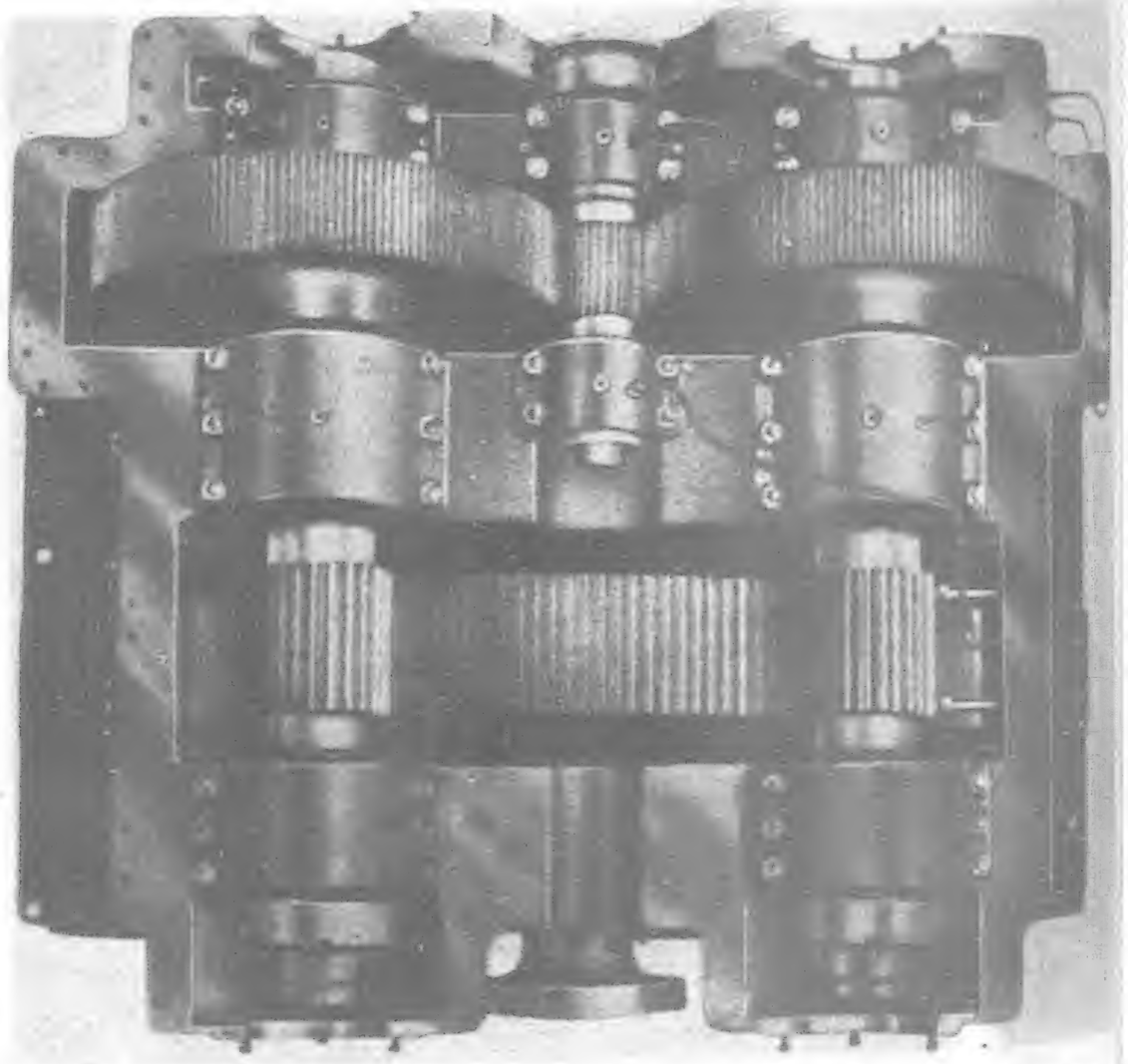


Fig. 7.—Marine Reduction Gear with Mang Gear of Nickel-Chromium Steel. Manufactured by Ishikawajima Ship Building Co.

added to steel it completely dissolves in the iron (ferrite) constituent and therefore its action is relatively independent of carbon as regards tensile strength, although the higher the carbon the greater the elastic ratio.

Nickel is particularly important in the manufacture of large forgings, because it has a tendency to render steel more homogeneous and to lessen segregation.

Chromium is added primarily to harden and strengthen the steel. It acts to improve the properties of steel principally through the formation of carbides.

Molybdenum is very similar to chromium. It is more powerful than chromium in its effects, and in addition has the valuable characteristic of increasing the depth-hardening of steel and nullifying temper brittleness. It acts for the most part through the formation of carbides.

Vanadium acts as a toughener and strengthener of steel. It also forms carbides, but has the valuable property of reducing grain size.

Properties of Nickel Alloy Steel Forgings

Nickel-Chromium Steels: By a combination of nickel and chromium it is possible to get a stronger, harder steel than by the use of either alone, and at the same time obtain good fatigue and impact values. Since these properties are best developed by the quench-and-temper heat treatment comparatively little nickel-chromium is used in the annealed condition.

It is commonly known that chromium steels exhibit under certain conditions a phenomenon known as temper-brittleness or blue-brittleness and nickel-chromium steels are no exception to this rule. If, for example, a nickel-chromium steel forging be slowly cooled from the tempering temperature it may be found that when cold the forgings will be very brittle and will not withstand shock. The remedy is simple—cool rapidly from the tempering treatment by quenching.

Nickel-Molybdenum Steels: The combination of nickel and molybdenum is an excellent one. Nickel-molybdenum steels are easier to make than steels containing oxidizable elements, they exhibit remarkably uniform properties, forge readily and respond very well to any heat treatment. Molybdenum, in addition, has the property of eliminating temper-brittleness.

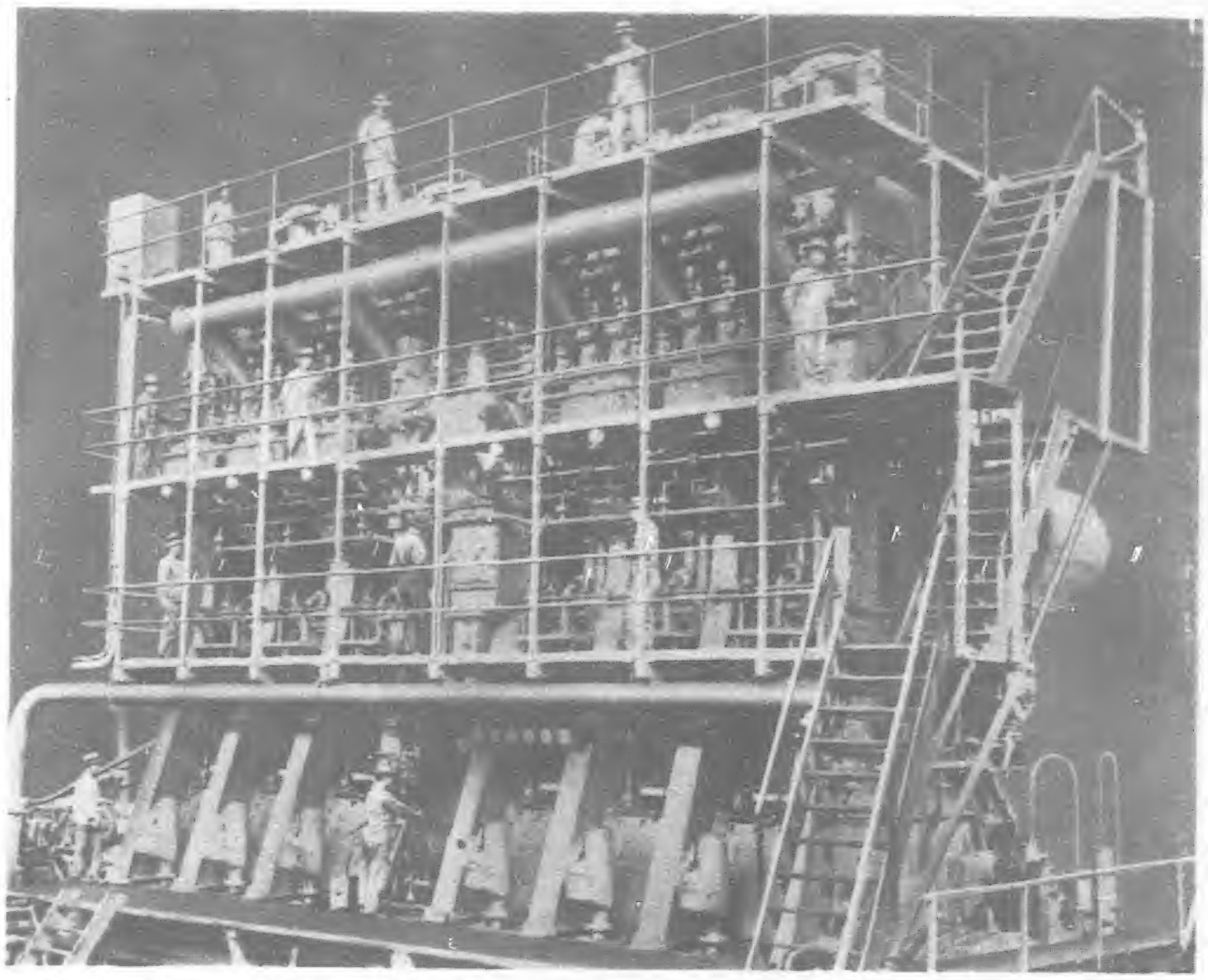


Fig. 8.—Marine Diesel Engine of 7,000 shaft horse-power. Manufactured by the Shipbuilding department of Mitsui Bussan K.K.

Ni Cr. Carburized Steel: Liner for Piston in Fuel Pump
Ni-Cr. Steel: Gears for blowers, gears for governors, gears for pump attached to crankshaft
Ni-Cro-Mo Steel: Exhaust valve spindle
Ni Steel: Valve spindle for indicator of main and Auxiliary Engine

Nickel-Chromium-Molybdenum Steels: Although more expensive, a steel containing nickel, chromium and molybdenum has excellently balanced characteristics, being strong, tough and hard. It responds to heat treatment readily, and is free from temper-brittleness. This steel, or a similar one with the addition of vanadium, is quite widely used for die blocks, the large majority of which are made from nickel steel.

Nickel-Vanadium Steels: These steels are not as extensively used as they might well be. Nickel-vanadium steel is used for large castings in order to obtain a fine-grained steel with high strength and ductility. The same features which make it valuable for castings recommend it for large forgings.

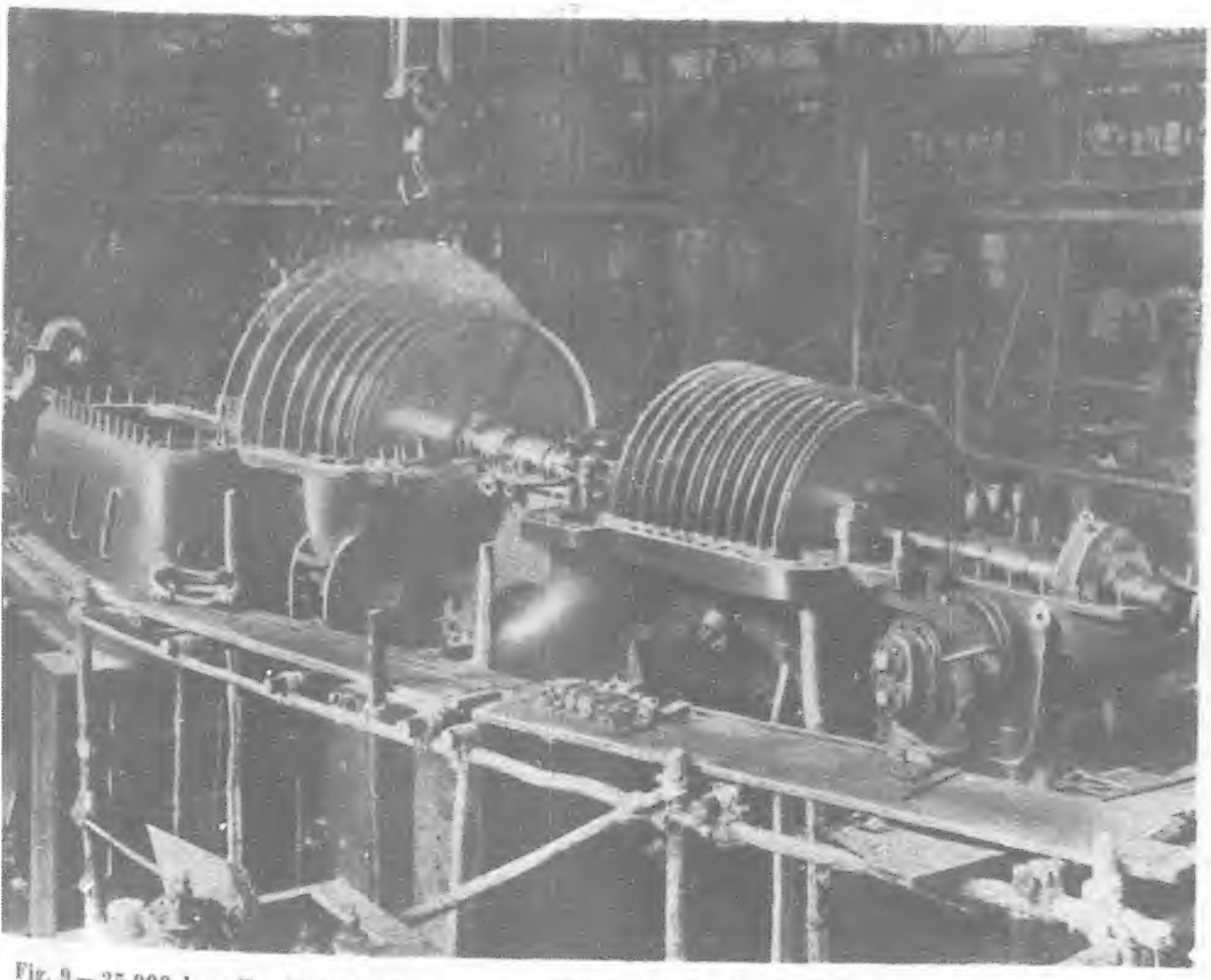
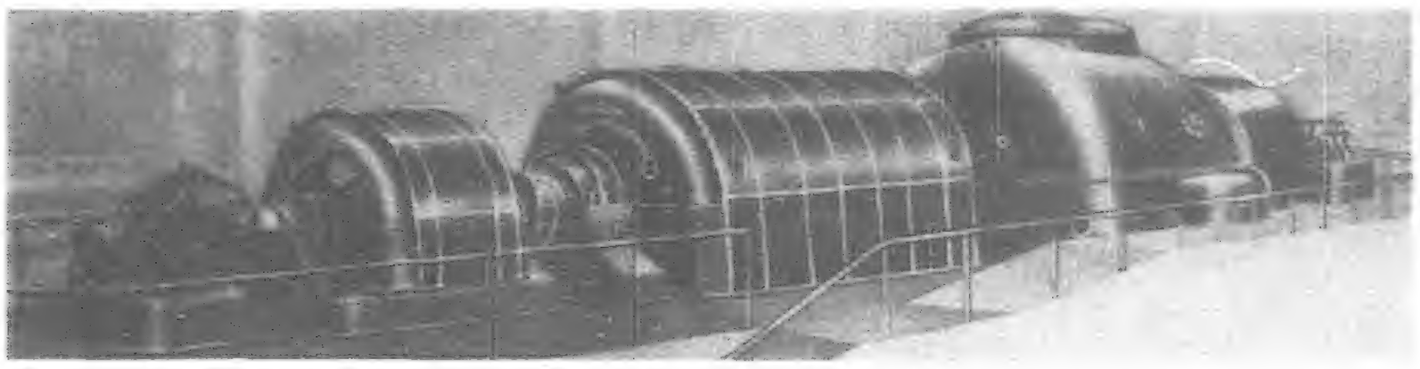


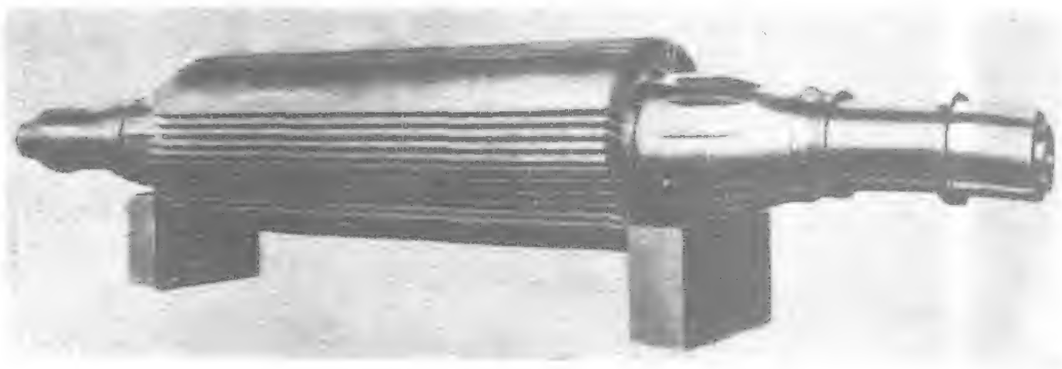
Fig. 9.—25,000 kw. Turbine under construction. Nickel Alloy Steels used in a Mitsubishi Zoelly Steam Turbine

Nickel Steel Plate

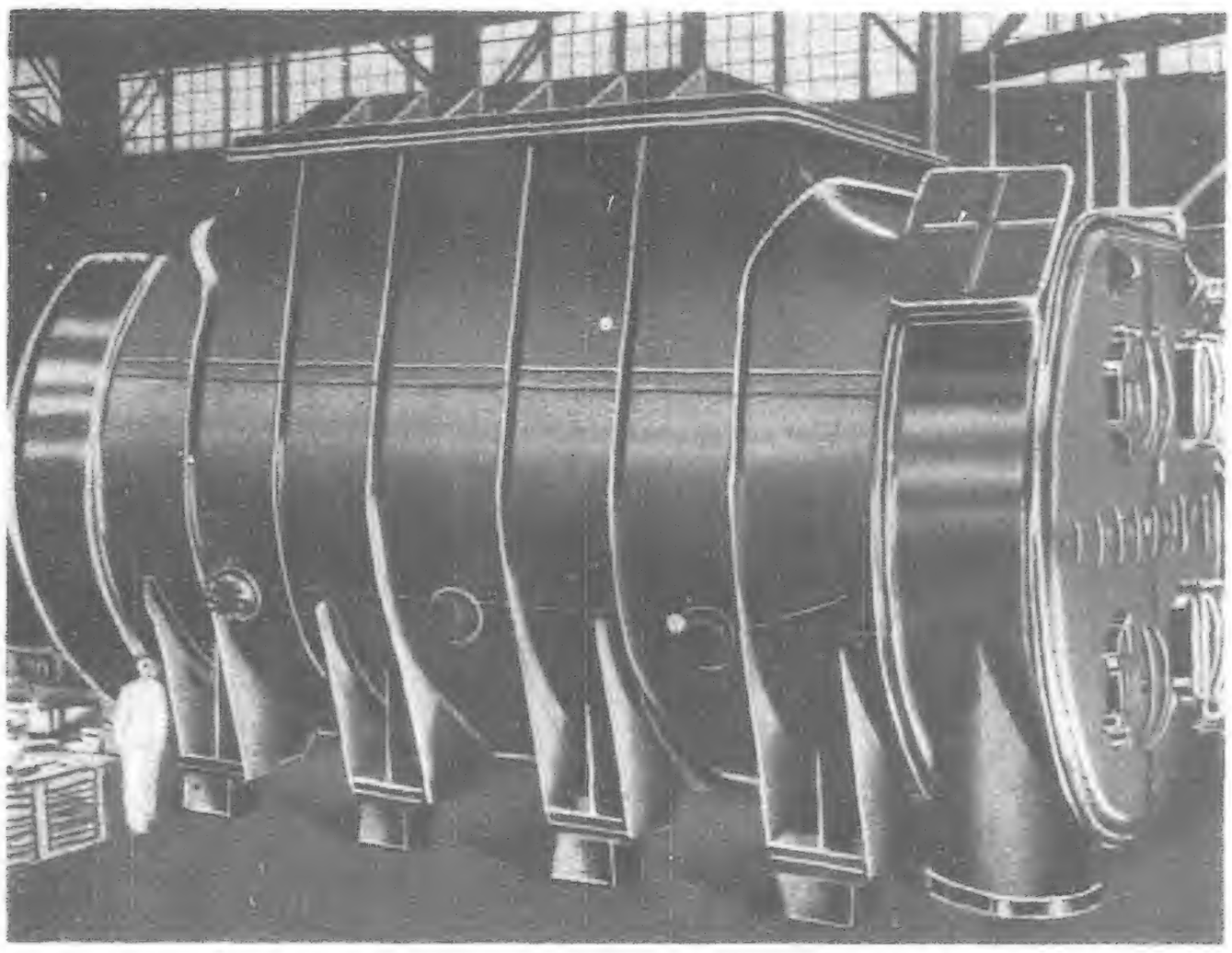
Nickel steel plate has been employed since the early days of alloy steel manufacture. It is used for circular saws and saw disks, structural material for bridges, etc., ship plate, protective deck plate and armor plate for warships, automobile-frame stock, etc. During the World War large quantities were used as protective plate, not only for warships but for tanks, caissons, field-piece shields, etc. For many of these purposes the nickel was combined with other alloying elements, such as chromium.

Nickel steel plate is used for the construction of steam boilers. The success which the plate has gained in boiler construction has stimulated its use where a plate of high physical characteristics is desired, not only in boilers and pressure vessels, but for other structural purposes. Table II shows





62,500 kva Turbo-Generator Rotor



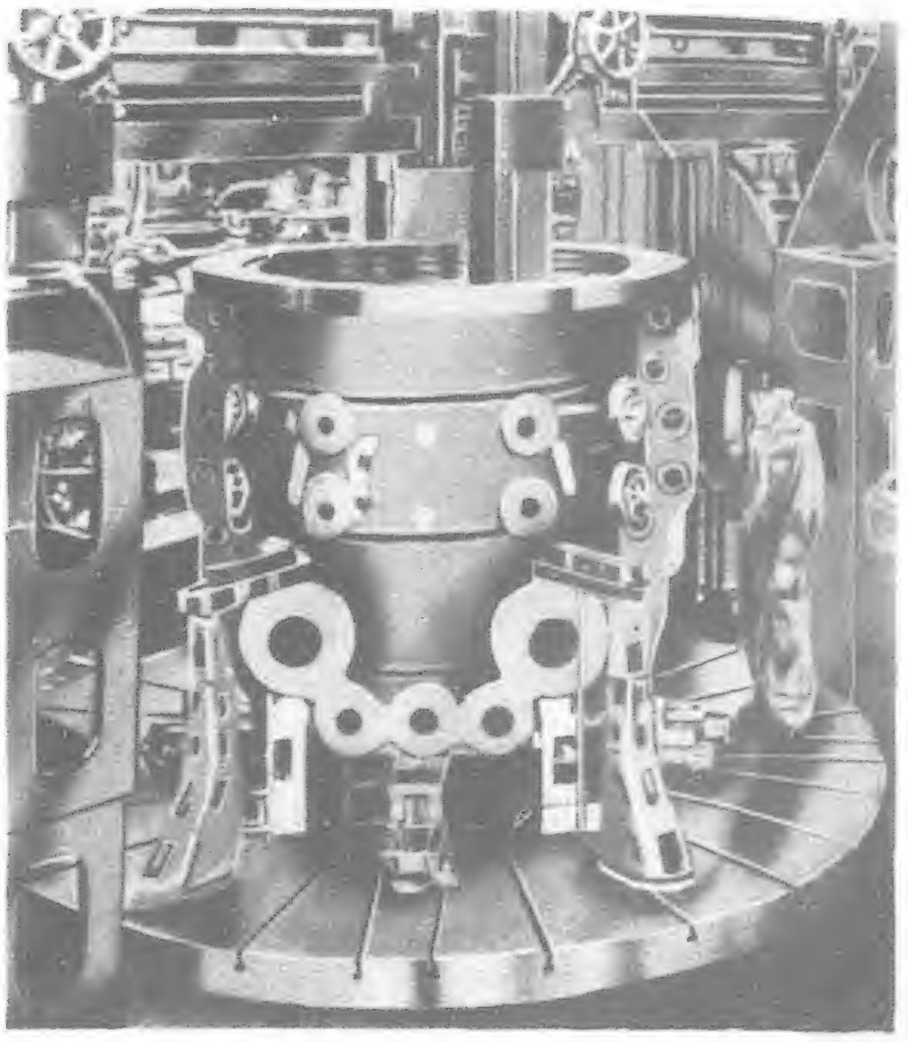


Fig. 10.—Constructed by Shibaura Engineering Works and Inshikawajima Shipbuilding Co. The characteristic point in the construction of generators is the rotor. In Westinghouse Electric Co., a Built-up Rotor is used for the generator of 75,000 kva while in Shibaura Engineering Co., one steel forging is used for the purpose. The material contains Ni, Cr, and Mn. and has a maximum tensile strength 63 kg/mm², elastic limit 35 kg/mm² and elongation 30 per cent. It was forged by Nippon Steel Works. The weight of the ingot is about 122 metric tons and the finished weight about 58.5 metric tons. Nickel alloy steels used in turbine parts

the analysis and tensile properties required by a representative specification for nickel steel boiler plate, as well as the average results of 523 tests on such steel, and, for comparison, similar results on a carbon plate steel. Primarily nickel steel is used because its strength is higher than that of carbon steel, while its ductility is practically the same. But, in addition, the other qualities which are necessary in a boiler are developed with nickel steel to a higher degree than with any other material, so that it is particularly suited to boiler requirements. These additional qualities are its physical characteristics at high temperatures, its excellent impact values, its resistance to embrittlement in boiler service, and its uniformity.

TABLE II.—COMPARATIVE DATA ON NICKEL AND CARBON PLATE STEELS

	Analysis of 3 per cent Nickel Steel	
	Average	*Specified*
C	0.163	0.20 (max.)
Mn	0.557	0.40–0.80
P	0.021	0.045 (max.)
S	0.029	0.045 (max.)
Si	0.203	Not specified
Ni	2.960	2.75–3.25

TENSILE PROPERTIES OF NICKEL AND CARBON STEELS

	3% Nickel Steel		*Carbon Steel*
	Avg. 523 tests	*Specification*	*Avg. 385 tests*
Ultimate tensile strength, kg/mm² ..	55.3	49.0 (min.)	41.4
Yield point, kg/mm²	33.3	0.5 × U.T.S.	25.3
Elongation in 200 mm., per cent ..	18.4	1,120/U.T.S.	20.1
Reduction of area, per cent	54.15	50	Not determined
Izod impact, kg.m :	8.8	—	Not determined

Fig. 11.—Scout Plane manufactured by Mitsubishi Aircraft Manufacturing Co. Nickel-Chromium Steel used for Struts, Crank Shaft, Piston Rod and other parts

Attributes of Nickel Alloy Steels

When nickel is added to molton steel of hypo-eutectoid composition, it dissolves in the iron to form an iron-nickel alloy. When this steel is cooled through the critical range, this iron-nickel alloy replaces both the free ferrite and the pearlitic ferrite of the carbon steel. It is the influence of this iron-nickel alloy on the formation of pearlite which causes the great increase in the tensile strength of nickel steel.

(To be continued next month)

Canning Industry in Japan

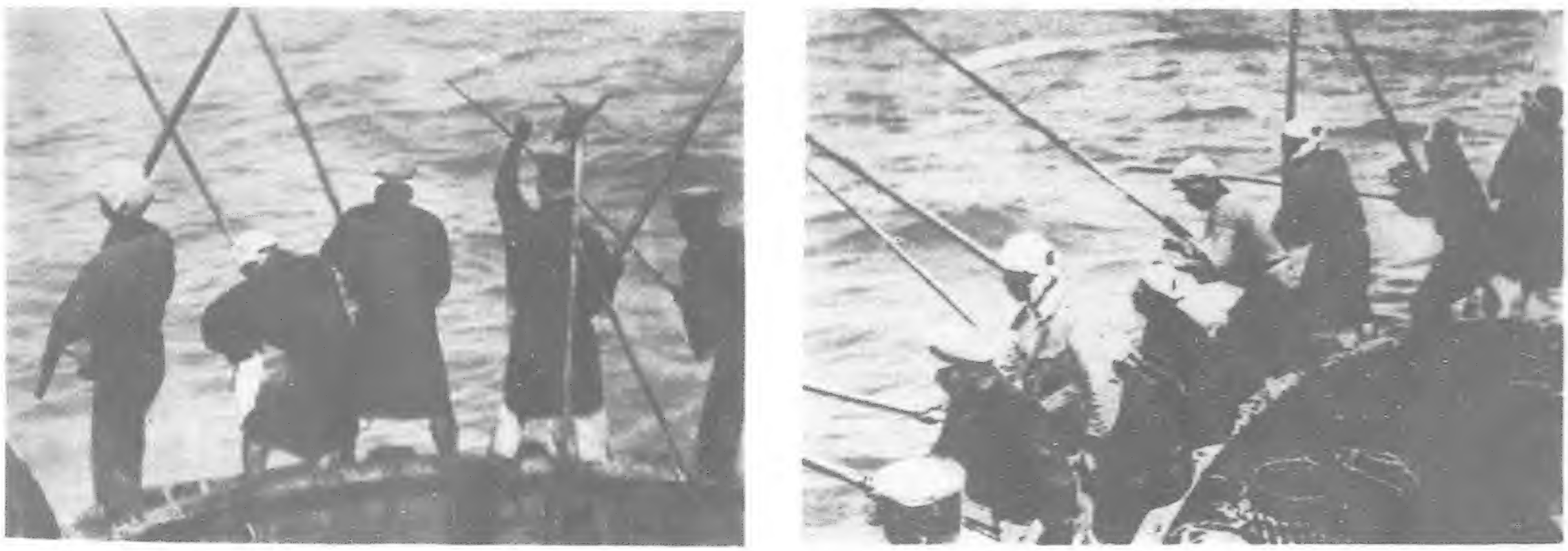
By EISABURO KUSANO

THE canning industry in Japan, since it was introduced by a Frenchman at Nagasaki in 1871, has made such development that it claims to be next only to the United States in the world in the volume of annual production. The Japanese canned delicacies of a large variety, including fruit, vegetables, fish, and so on, have found their way to all parts of the world, besides satisfying the domestic needs. In point of fact, the substantial increase of exports, particularly since the depreciation of the yen exchange rate, has eventually given rise to various international troubles.

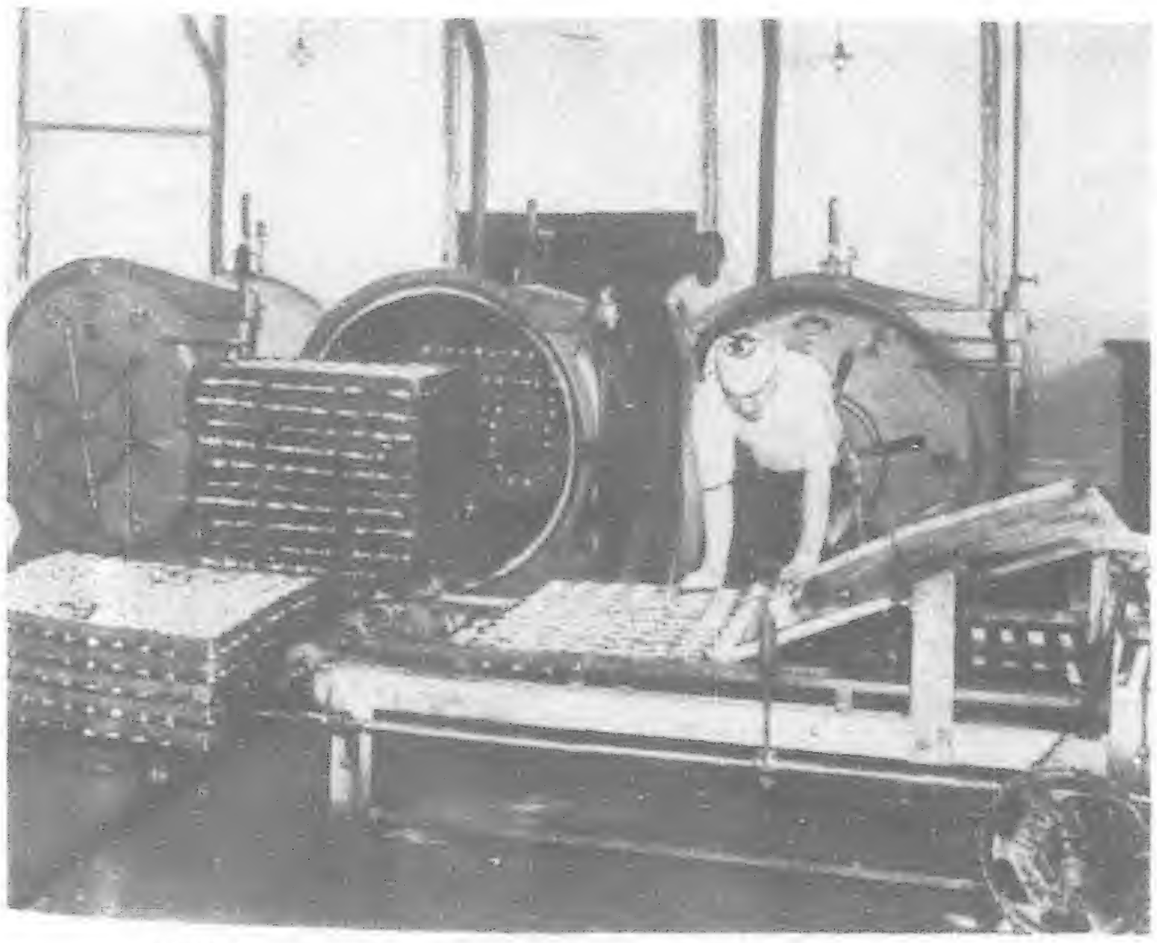
The "Kosei Maru" 5,500 tons, floating salmon cannery of the Okidori Godo Gyogo K.K. Capacity, 2,100 cases of ½ lb. salmon cans daily, one case containing 8 dozen cans. Forty-one vessels with engines serve this cannery

Rival foreign canned foodstuff manufacturers have found themselves defeated on their home ground as well as in their overseas markets by the Nipponese competition, and their respective Governments have been moved to take protective steps from the stand point of what is called economic nationalism, the world-wide tendency which has been prompted and accelerated by the long depression.

And so, in the United States, a vigorous movement is going on to restrict the import of Japanese canned tuna (albacore); France has found that recent imports from Japan of canned salmon



Fishing for "Tonbo-Maguro" (Albacore) hundreds of miles from shore



Filled cans that are ready for steam sterilization

Cans coming by conveyor from store room to filling tables

and crab meat have been excessive ; the British tin-plate manufacturers have made it imperative that Japanese canned goods makers use the British product in making the containers in exchange for the British importation of Japanese canned stuffs. The fishing interests of Japan, on the other hand, are again having trouble with the Soviet Russian State enterprise as regards the renting of fishing lots in the Asiatic north sea and the Japanese Government in the meantime has decided to exercise a strict control over the maritime products exported from Japan by virtue of a measure, the enactment of which is scheduled at the present session of the Imperial Diet.

Such difficult prospects as well as a string of troubles other than those outlined above notwithstanding, the canning industry in Japan is making further progress and expansion steadily by means of the introduction of new machinery as well as by amalgamation of capital.

It is recalled, however, that the Japanese canning industry, which to-day presents a "formidable" competition to foreign manufacturers, had a modest beginning 60 years ago when the industry was already well established abroad.

Fish being cut into sizes convenient for packing

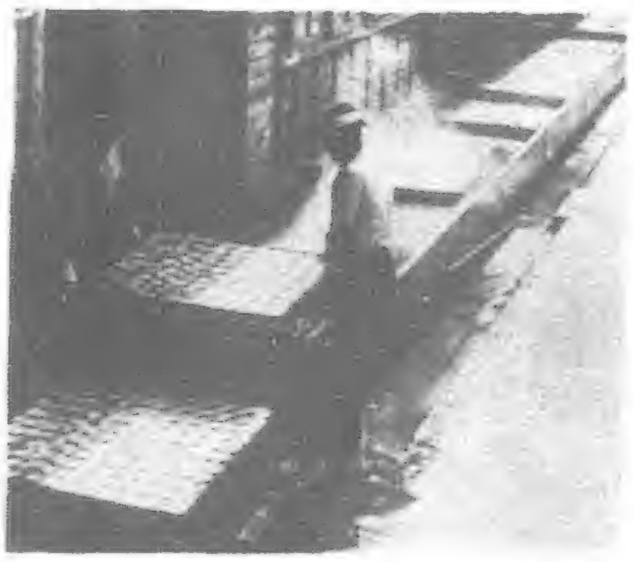
Taught by Missionary

When a French missionary in Nagasaki taught some local Japanese a method of canning sardines in olive oil in 1871, that was the first canning ever done in Japan. But it apparently ended as a novel experiment for nothing is recorded of its having developed into an industry. So another new start was made in 1877 when the Japanese Government, by enlisting the service of two American experts, established a cannery in Hokkaido and did its best to encourage canning. Because of the imperfect understanding on the part of the Japanese of canning methods and also due to scanty demand of the public in Japan in those days, neither the official attempt in Kokkaido nor other private enterprises made any appreciable progress.

Salmon being sent to cannery by conveyor from ship

The first epoch in the history of the canning industry in Japan was marked in 1888 when the Japanese Government established the Imperial Fishery Institude in Tokyo and elsewhere. These institutes educated the public to appreciate the need of utilizing Nature's generous gifts found abundantly in Japanese waters.

In the meantime, the craft of can making likewise showed rapid progress, owing partly to assistance and co-operation rendered by Americans who had blazed a new trail in that field, and also due to the initiative and ingenuity of Japanese mechanics. When later the World War broke out, the can making industry became a highly specialized division of the canning industry in Japan. The introduction during this period of the automatic can making machines invented in the United States has done much to popularize the use of sanitary cans, superior methods of canning, and to establish the system of examining canned goods.



Sterilizing the packed cans

So the canning industry of Japan began making real progress. The increasing demand at home helped materially to improve the quality of the product, and the improvement in quality in turn resulted in further increases in the demand. Subsequently, the increased output brought about the need of an outlet in the over-seas markets. To-day, Japan produces more than 4,000,000 cases of canned goods of every description a year, valued at more than Y.60,900,000.

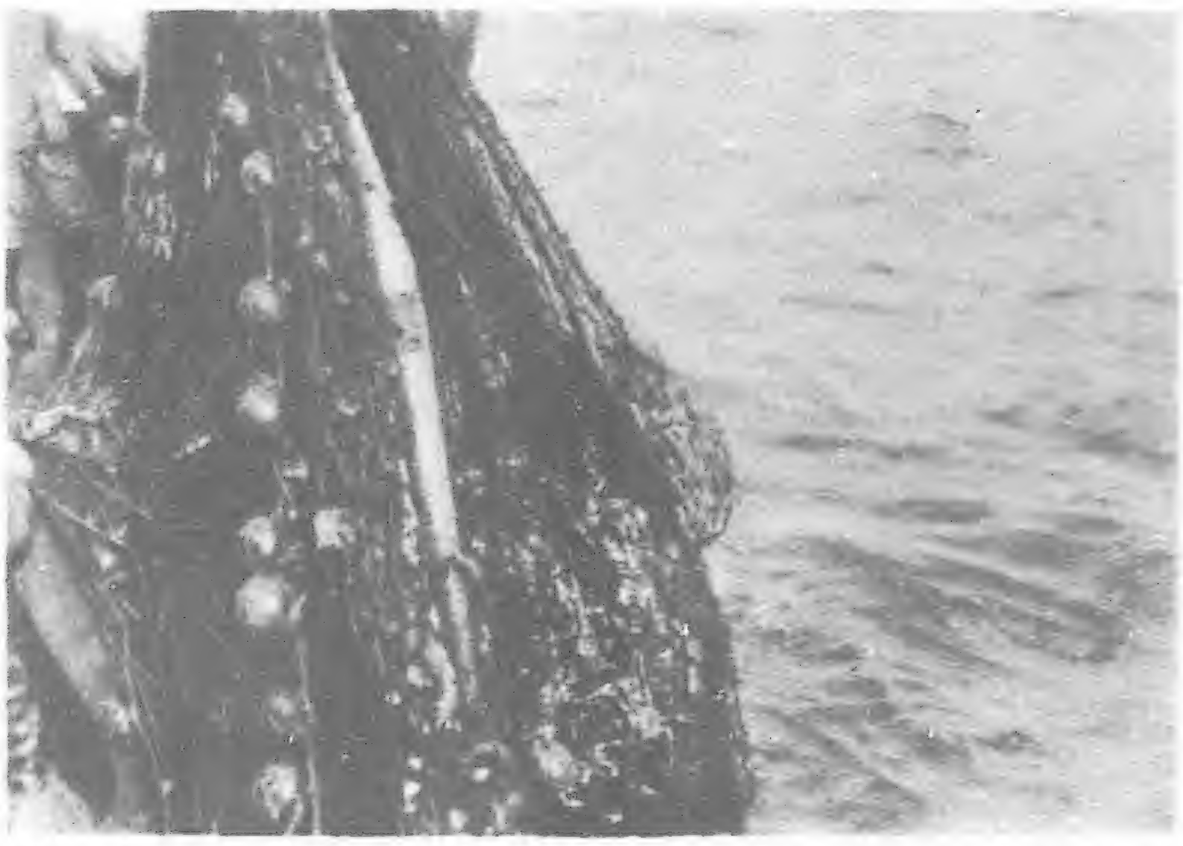
The canning of marine products, particularly salmon, made the most rapid and conspicuous strides of all the branches of the industry in Japan. The average annual output in recent years has been 1,300,000 cases, valued at Y.26,000,000. Close upon the heels of the remarkable development of salmon canning is the crab canning industry. Since Japan's canned crabmeat made a big hit in the United States whether experimental shipments were made in 1908, this particular branch of enterprise has progressed by leaps and bounds until to-day Japanese canned crab stands peerless in quality and volume in the world. Although the canning of sardines, dipped in tomato sauce, and also of mackerel is done now in Japan, it has not passed the experimental stage as far as export trade is concerned. Canning tuna fish is also of comparatively late origin in Japan.

In addition to fish, several kinds of shellfish are also put into cans, these including : "Awabi" *(haliotis gigantea gmelin)*, "Hotate-gai" *(pecten yessoensis jay)*, "Hotsuki-kai" *(meretrix linni)*, "asari" *(pahia ruditepes philippinarium*, Adams and Reeve), "kaki" (oyster), "sazae" *(turbo batilluscornutus solander)* "aka-gai" *(anadara inflata reeve)*, and so on.

Pineapples lead in the fruit canning of Japan. Practically all the pineapples produced in Japan are grown in Taiwan (Formosa)

Varieties of Salmon

A Floating Canner carries a number of small boats which go out to catch crabs. A net with weights below and glass floats above the water is spread and after a fixed time is dragged to the cannery



Here is a net with its catch of crabs which is seen being hauled aboard the Floating Cannery

where in 1924 shoots of the Smooth Cayenne species were imported from Hawaii although previous to that year the cultivation was limited only to native species. Canned oranges are immensely popular in America and Britain largely because of their fitness for candy making. Besides these, peaches, pears, cherries, apples, and other fruits are packed in jars and as jam, but they are still produced in quantities hardly large enough to meet the domestic demand.

As regards canned vegetables: canned bamboo sprouts have been made primarily for domestic consumption but a small quantity is being exported to China and the United States. But it has a good chance of increasing as an export in view of the growing popularity of chop suey dishes in America and Europe. Green peas, asparagus, string beans, and some other kinds of vegetables are also canned, but they are mainly for domestic consumption.

Packed meats in Japan at present do not amount to much although to a certain extent, beef, pork and chicken are sold in tinned form. Japan does not seem to stand much chance of becoming an exporter of meats, either canned or fresh, at least in the immediate future, although live stock breeding is in an evolutionary stage.

A Specimen of the King Crab

Further details on some of the representative branches of the canning industry in Japan follow:

Salmon, Pioneer Enterprise

Canning salmon has been a pioneer enterprise in the history of Japan's canning industry. For it was this fish that was handled at the cannery built in Ishikari, a village at the mouth of the River Ishikari, Hokkaido, in 1876, with the aid of two American experts who were invited by the Government Commission for Hokkaido Development. Actual operations were started the following year 1877.

The capacity of this early stage cannery was limited, the daily quantity handled ranging from 100 to 300 salmon. The annual output hardly exceeded 5,000 cans.

The Japanese Navy's adoption of canned salmon proved a stimulus to the production which made a substantial increase during and after the Sino-Japanese and the Russo-Japanese Wars

Handling the catch of crabs, the legs and bodies being separate. Right, a catch of king crabs dumped on deck

in 1894-5, and 1904-5, respectively. The steady growth of demand for canned salmon at home and abroad resulted in the further advances of the output.

In 1910, when the Japanese fishery activities in Kamchatka began, a new phase of development was marked in the history of the salmon canning industry. Previous to that year, the daily output amounted to 300 cans at best, but the production made jerky advances following the advent of the Kamchatka operations.

Members of the Japan Salmon Canners' Association produced 1,413,844 cans in 1932. In the prosperous year of 1930, the output reached 1,621,929 cans but it sharply declined to 1,169,600 in 1931 Salmon is divided into five kinds, namely, red, silver, king, pink, and chum. The silver, king, and chum salmon are caught only in the Kamchatka waters.

Japan's salmon fishing ground is geographically divided into four districts, which are: the region around Aomori Prefecture, the northern end of the Main Island; Hokkaido and Chishima islands as a group; Karafuto, the southern half of Saghalien; and Kamchatka. Besides the land plants in these districts, floating canneries are also active.

The following table gives tangible details of the salmon canning in Japan: (Unit: cans)

1931

Districts	*Red*	*Silver*	*King*	*Pink*	*Chum*	*Totals*
Aomori	—	—	—	256,344	—	256,344
Hokkaido, Chishima ..	4,055	—	—	126,395	—	130,450
Karafuto..	—	—	—	18,994	—	18,994
Kamchatka	462,005	47,910	5,177	185,191	1,051	701,334
Floating factories ..	33,267	4,236	810	2,130	22,035	62,478
Totals	499,327	52,146	5,987	589,054	23,086	1,169,600

1932

District	*Red*	*Silver*	*King*	*Pink*	*Chum*	*Totals*
Aomori	18,000	—	—	100,972	92	119,064
Hokkaido, Chishima ..	8,489	—	—	51,664	—	60,153
Karafuto..	—	—	—	1,069	—	1,069
Kamchatka	414,294	30,332	6,783	712,069	3,333	1,163,478
Floating factories ..	59,296	178	604	6,669	—	70,080
Totals	500,079	30,510	7,387	872,443	3,425	1,413,844

Note :—Output by foreign enterprises in these districts is not included in the foregoing tables.

The Japanese Salmon Canners' Association, with 55 members includes all the leading canners of the country, and its functions are under control of the Agriculture and Forestry Office, which also controls the fishing industry in Japan. The Association conducts

A Floating Crab Cannery breaking through ice fields in the northern seas

strict conditioning of products at its conditioning offices located in eight principal cities. There are five classes in conditioning. The best is called "choice" and the second class, "standard." Any class below "standard" is not allowed to leave Japan. The bulk of Japan's exports, however, is the "choice" class.

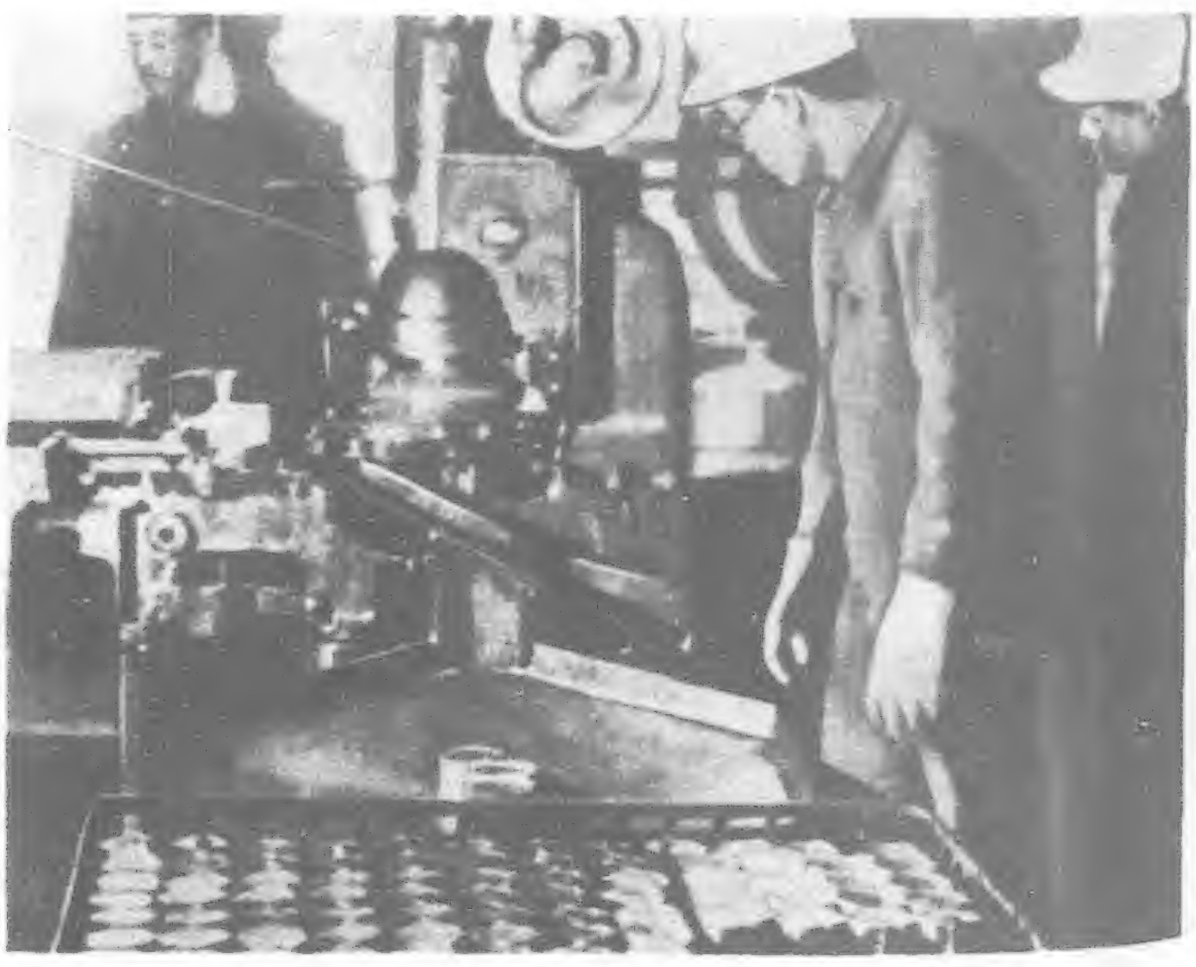
The canned salmon exports are placed under the control of the Association which works out the quota to each of its members, particularly in the case of export to France where imports from Japan are restricted by the quota system. According to the latest agreement, which took effect on October 1, 1933, for a period of one year, the Japanese export of canned salmon to France is limited at 74,600 kintar (one kintar is 100 kilograms). This is smaller than the quota for 1932-3, but the quota is the same as that granted to Canada, Japan sharing the most favored nation treatment. The export of canned salmon to countries where imports from Japan are restricted is accompanied by the certificate of origin, testified to by the Association, and also with that of volume, bearing the O.K. testimony of the Agriculture and Forestry Office.

Crab-meat Canning

The Japanese canned crab-meat which enjoys the reputation of being a most delicious sea food is prepared from what is locally known as "Taraba-gani" which, in English, is called King crabs.

King crabs abound in the north-west corner of the Pacific Ocean along the coast of Hokkaido, the Chishima islands, Karafuto (Saghalien), Kamchatka, and the Maritime Province of Siberia where cold currents are prevalent. They never live in warm water.

Crab meat being taken out of legs and boiled



The cans, filled with crab meat are sterilized

It has a hard shell and phenomenally long and strong legs. Unlike other crabs, it is a clean feeder, living on the clean sandy ocean floor, remote from densely populated shores. Its meat, therefore, is safe from any contamination from unclean water. The legs and body are covered with a thin skin under the hard shell. They grow to quite a large size sometimes weighing as much as 20 pounds. However, the ordinary sized crabs for canning purpose weigh about an average of eight pounds, running in length from three to four and a half feet from tip to tip. Any smaller sizes are not allowed to be caught, and female crabs are being protected.

Crab fishing season varies with the territory. In some places it begins as early as February, though it generally starts in March and ends in October. In the far northern waters, operation is possible only between May and August.

In canning the crab-meat, crabs are boiled soon after they are caught. Then they are shelled and thoroughly washed. The body and legs are cut into solid pieces of proper size which are placed in sanitary cans which are lacquered inside and lined with parchment paper to avoid direct contact of meat and tin. The tins are then sealed and sterilized.

Besides canneries ashore, there are floating canneries, the appearance of which is largely responsible for the marked development of the industry in recent years. For up to 70 per cent of the aggregate total production of canned crab-meat is turned out aboard these floating conneries. In the early days, these were sailing ships of about 300 tons equipped with auxiliary engines. To-day, they are steamers of from 3,000 to 8,000 tons which are invariably equipped with up-to-date machinery. These floating canneries have the advantage of going far away from the shore to catch and pack immediately on board, the product consequently preserving its fresh sea flavor. Up to 1921, that is, previous to the introduction of floating canneries in the crab-meat canning industry, the enterprise was limited only to the shores of Hokkaido and Karafuto where the supply soon ran short. These floating factories, however, extended the fishing grounds with the result that the output has substantially increased.

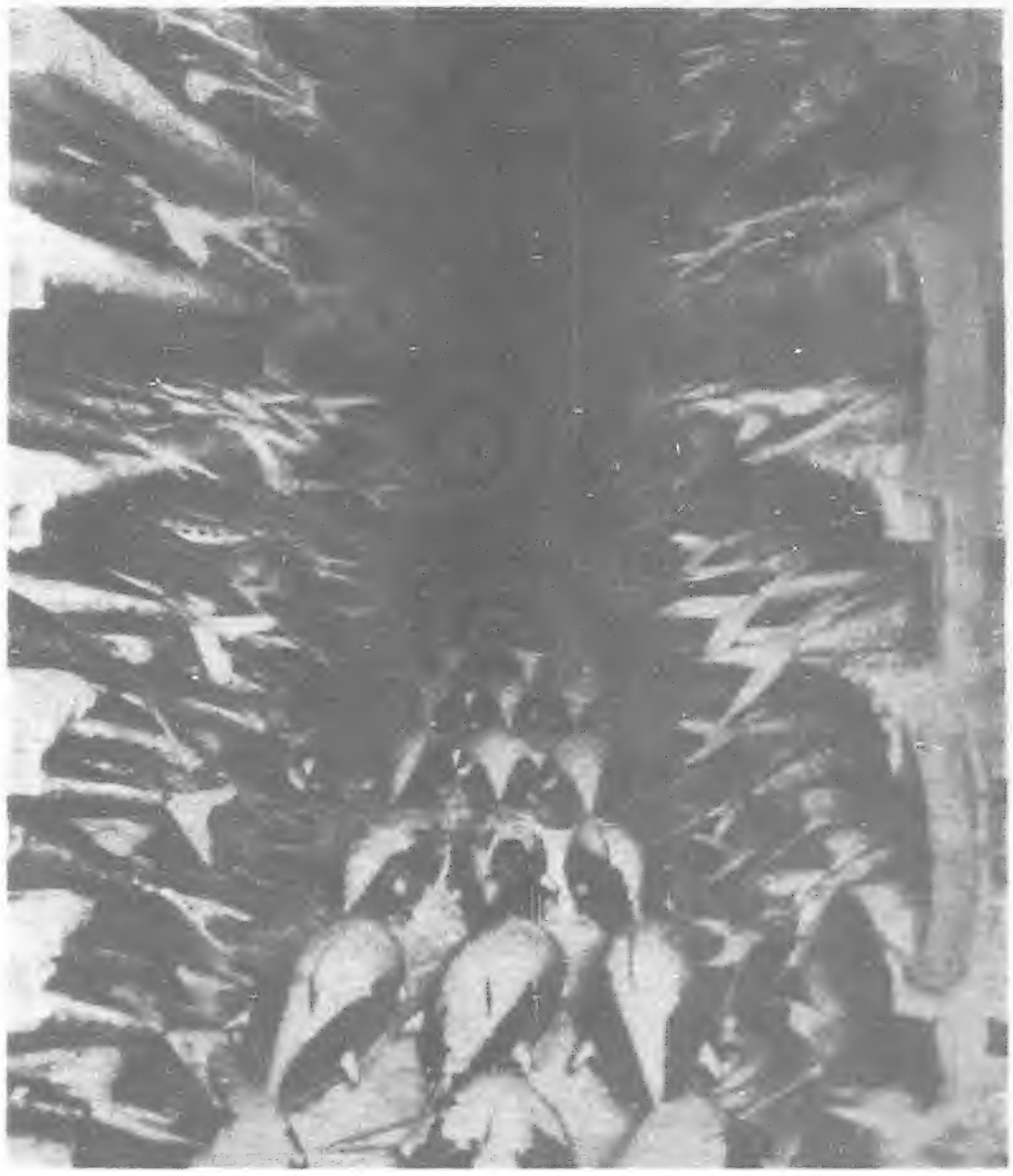
The following table gives the annual output of canned crab-meat during the three years ending in 1932 according to districts: (Unit : case)

Districts	*1932*	*1931*	*1930*
Hokkaido	51,833	60,226	47,447
Karafuto	29,773	59,278	57,849
Floating canneries	173,529	254,216	402,073
Kamchatka, elsewhere	51,572	65,741	67,569
Totals	306,707	439,461	574,938

It is interesting to recall that the Japanese canned crab-meat found its foreign demand as a substitute for canned lobster. Its demand abroad increased when the supply of lobster was short in New England and along the eastern coast of Canada, but it declined when the lobster supply in these districts was rich.

For many years, consequently, the export trade of the Japanese canned crab-meat was not steady. Nevertheless, the product eventually found a market of its own, independent of the canned lobster. But it was in and after 1923 that the substantial increase

A representative Japanese Crab Floating Cannery



"Tombo Maguro" (Albacore) in Cold Storage

has been made in the trade. In 1910, the annual export of canned crab-meat amounted to Y.700,000 in value, which increased to Y.20,000,000 in 1928. This total, however, has been on the steady decline since that peak year.

The Japanese Government keeps close watch on the quality of the canned-crab meat for export. Strict conditioning is conducted by the Japanese Canned Crab Packers and Exporters' Association, which was organized in 1924, in accordance with the regulations of the Agriculture and Forestry Office.

The canned crab-meat is classified in three grades as the result of such conditioning, namely, "fancy," "fair," and "passed."

Albacore "White Meat"

The American campaign to restrict the import of Japanese canned "maguro" (*Thunnus alalunga*, otherwise known as tuna or albacore) is one of the liveliest issues in Japan's canning circles to-day. A Japanese delegation representing the tuna canning as well as the frozen flesh of tuna exporters, who left Japan on February 6, 1934, for the United States, are negotiating with American packers in the hope of finding an amicable settlement of the pending issue.

It is learned that the Japanese exporters propose to exercise spontaneous control of the export provided that the import into America of 500,000 cases is guaranteed. Japan exported to America 700,000 cases in 1933. The proposed restriction is a heavy sacrifice on the part of the Japanese but the reduction by 200,000 cases, it is understood, has been proposed because the Japanese exporters are annoyed by the frequent attachments, disqualifications at the import conditioning stations, and other troubles which, it is alleged, have resulted from political manoeuvers on some occasions.

It so happens, however, that albacore yielding "white meat" are caught only in Japanese waters in recent years. They were caught in California waters in earlier days but the stock gave out in about 1926. The only region on the American side of the Pacific where "white meat" albacore are found is the sea off Cape San Lucas

at the southern extremity of Lower California which is about 1,500 miles from Los Angeles. The quantity caught there, however, is reported to be insignificant, hence the inevitable import from Japan.

Japan ships " white meat" to the United States in two forms. One is the frozen flesh of tuna as the basic material which upon its arrival in California is packed and placed on the market. In this form, about 200,000 cases are shipped annually in a normal year. The other goes in the form of finished product of canned goods. These shipments are not sufficient to supply the American demand.

As substitutes for the Japanese " white meat" albacore, other species such as yellow fin tuna, blue fin tuna, skipjaw (bonito), and yellowtail, which are caught off California, are used to offset the deficit in supply. Albacore yielding white meat are caught in extensive areas in Japanese waters but they are found in greatest number in Suruga Bay, Shizuoka Prefecture.

The Japanese, however, do not care much for albacore white meat, and for this reason, it can be had almost for nothing. The only way they use it is by drying the white flesh somewhat after the fashion of dried bonito, whereas in America, albacore white meat is highly valued as epicures' food.

The first chance Japan had for exporting albacore into the United States came almost accidentally. A Japanese resident in California dipped cut chunks of albacore in oil and distributed it among Americans calling it " ocean turkey." The flesh, largely on account of its white color and the taste which appealed to them instantly made a hit with Americans. By the time the California waters became exhausted America had come to look to Japan for the supply of refrigerated albacore flesh.

The history of tuna canning (in oil) in Japan is fairy old. In about 1905, the marine products laboratory of Wakayama Prefecture made a series of experiments. They were followed by non-official enterprises. Afterwards the enterprise subsided for a time but was revived in 1927 and 1928, with the maritime products laboratories in Shizuoka, Kochi, Okinawa, and Chiba Prefectures actively taking the lead.

It was in 1932, when the oiled tuna output amounted to 264,941 cases, that the enterprise secured a firm toehold in Japan's foreign trade as an important cannery industry next only to crabmeat and salmon packing. Side by side with the growth of exports, the domestic demand has also increased, resulting in corresponding larger production. In 1930 there were only five packers but the number increased to 19 in 1932. All the tuna packing factories are situated at the ports where hauls of tuna arrive in large quantities. Many of the factories employ from 300 to 500 women operatives.

The tuna fishing ground is usually from 150 to 500 miles—sometimes even 1,000 miles—away from the packing bases. A tuna fishing craft on the average is from 150 to 200 tons in size.

The particular kind of tuna called albacore (or " tonbo-maguro" in Japanese) which yields white meat is caught abundantly, sufficient to meet the outstanding demand. But if the canned tuna export grows larger, other kinds of tuna will also be caught for canning purpose, thus substantially increasing the supply.

Mention should also be made of the fact that oiled tuna is exported, to Canada, Britain, Belgium and many other countries besides the United States.

Construction Work on the Chchow-Shaochow Section of the Canton-Hankow Railway

(Continued from page 175)

question, involving both cost of construction and economy of operation, further investigation over this section will be made before actual construction.

Foreign Materials

The Ministry of Railways has sent out two orders through the Chinese Government Purchasing Commission in London, for rails, accessories, bridges, construction plant and rolling stock for one district of 62 kilometers in the south and one of 87 kilometers in the north now under construction. All rails and accessories are of 43 kg. Chinese Government Standard and 12 meters in length. Bridges of various spans are all of standard design of E-50 loading prepared by the Ministry of Railways. All locomotives are of a new type of 4-8-4, with tractive effort of 17,500 kg., capable of attaining a speed of 80 kilometers an hour on level track and of hauling 1,000 metric tons at a speed of 25 kilometers per hour on a 1 per cent up-grade. This will be the standard type of locomotives to be used on the Canton-Hankow line for some time to come.

Minimum Estimates

In view of the limited funds available for the completion of this important line, especially the funds to be used in China, it is desired to make a minimum estimate on the work with the object of completing the line with all the available resources, leaving, if necessary, all the less important or less urgently needed work to be done after operation. Thus a soundly constructed railway with permanent structures of standard strength is required with possibly temporary buildings and shops and equipments for only immediate necessity. As funds for foreign materials are sufficient, more steel structures will have to be used in crossings where concrete bridges might otherwise prove more advantageous or economical. Station sidings, loops, yards, etc., will be provided for immediate use with full reservations of land for further expansion.

The following estimate is accordingly made based on previous surveys and estimates with certain revision of the price of materials and labor :

MINIMUM ESTIMATES FOR THE CONSTRUCTION OF CHUCHOW-SHAOCHOW SECTION OF 401 KM. OF THE CANTON-HANKOW RAILWAY

	Items	*China Fund in Dollars*	*London Fund in Pounds Sterling*
1.	Earth Work : Earth Cutting and Filing	3,850,600	
	Rock Cutting	6,908,500	
	Retaining Walls, etc.	2,132,100	
2.	Tunnelling :	2,398,300	
3.	Bridges and Culverts : Masonry	4,895,500	
	Steel Construction	780,000	170,000
	Culverts	1,853,900	
4.	Right of Way Protection :	35,850	
5.	Telephone and Telegraph :	298,700	10,000
	Train Signals	119,500	
6.	Track : Sleepers	3,824,900	
	Rails		329,120
	Accessories		87,500
	Track Tools	20,000	1,000
	Track laying and Ballasting	1,129,200	
7.	Points and Crossings :	20,000	28,000
8.	*Buildings : Head Office*	50,000	
	Station Buildings and Platform	900,000	
	Small Shops and Stores	38,900	3,000
	Staff Quarters and Gang Houses	478,000	
	Water Towers and Pumps	150,000	12,500
	Coaling Stations	75,000	
	Turn Tables	18,000	4,000
	Weigh Bridges	8,000	4,000
9.	Engine Sheds and Equipments :	125,000	120,000
10.	Rolling Stock : Locomotives		240,800
	Passenger Coaches		192,500
	Freight Cars		300,000
	Locomotive Cranes		10,000
11.	Maintenance during Construction :	90,000	
12.	Surveying and Instruments :	215,250	5,000
13.	Land :	1,135,000	
14.	General Expenses :	3,000,000	
15.	Contingencies :	961,000	127,580
		$35,511,200	£1,645,000

Manchurian Pulp Factory

The establishment of a pulp factory in Manchuria is being studied in Japan, it is said. The prime mover in the plan is the Ohji Paper Mill in Tokyo and with it are a number of rayon filatures. The proposed capital of the pulp manufactory is said to be Y.20,000,000.

Promoters are seeking an understanding with Manchoukuo about plan, it is reported. One of the promoters observes that Japan has to depend on imported pulp for the manufacture of rayon but when the manufactory in Manchuria materializes, importation of foreign pulp will be no longer necessary.

The New Osaka Shosen Kaisha Passenger and Cargo Steamer "Takachiho Maru"

THE Osaka Shosen Kaisha's passenger service between Japan proper and Formosa has been maintained by three vessels, the *Fuso Maru*, *Horai Maru* and *Mizuho Maru*, all of which possess adequate accommodation for passengers. These boats, however, are fairly old, and accordingly the Company has decided to replace them with faster vessels of increased tonnage.

The *Takachiho Maru* is one of the new vessels. Its keel was laid on April 18, 1933, at the Nagasaki Shipyard & Engine Works of the Mitsubishi Shipbuilding & Engineering Company, Limited. She was launched on October 5 of the same year and was completed on January 31, 1934.

The principal dimensions of the vessel are :—

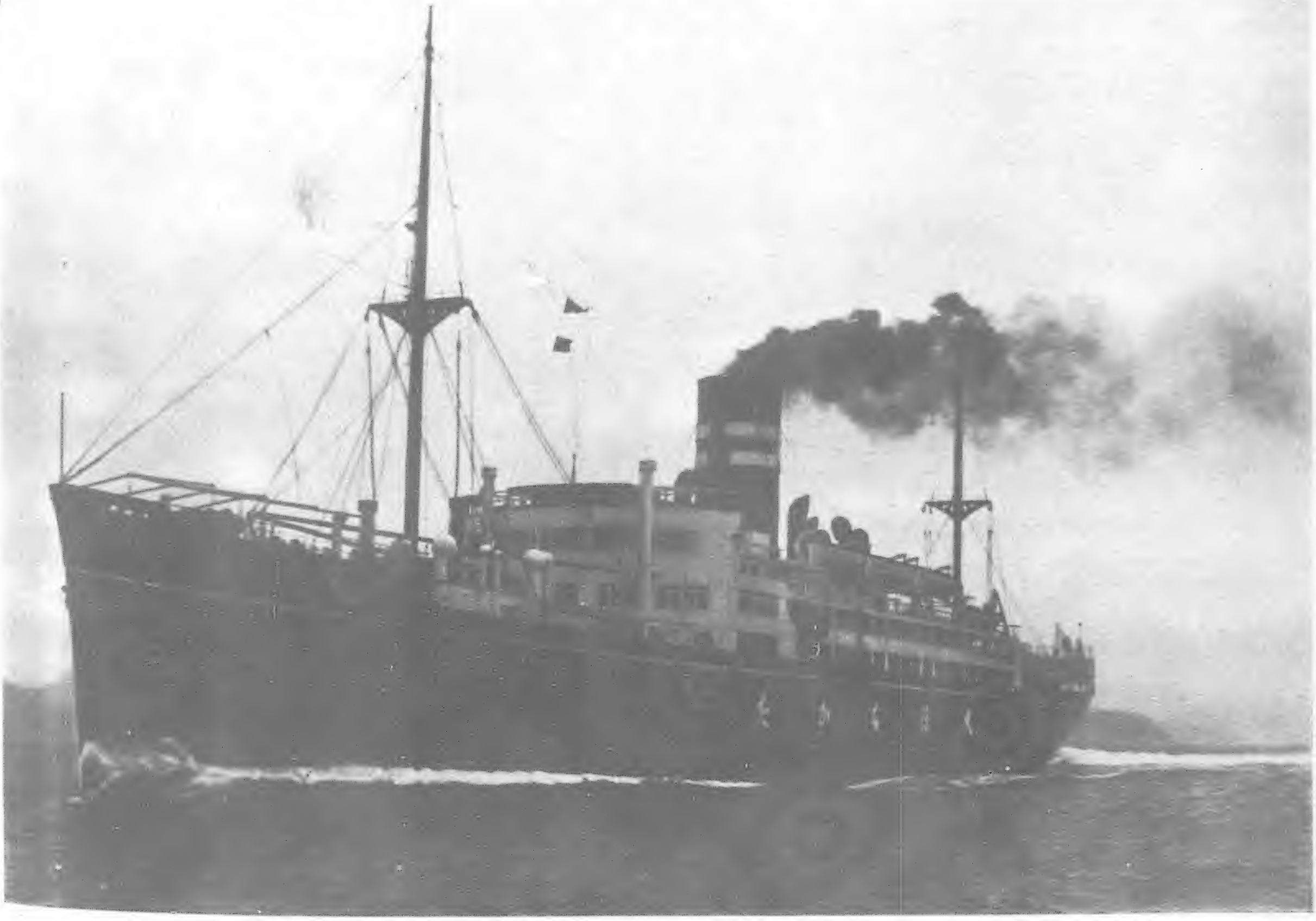
Length over-all	473-ft.-0-in.
Length between P.P.	450-ft.-0-in.
Breadth moulded	59-ft.-0-in.
Depth moulded to upper deck	37-ft.-0-in.
Full load draft	24-ft.-3-in.
Gross tonnage	8,154.24
Deadweight carrying capacity	6,300 tons
Speed (maximum), trial	19.183 knots
Main engines	2 sets—Mitsubishi-Zoelly Impulse Turbines
Main boilers (multi-tubular type)	7
S.H.P. (designed)	7,000
Passenger accommodation for	First class 35; Second " "A" 72; " "B" 60; Third " 618

General Description of the Hull

The vessel is a steel twin-screw cargo and passenger steamer constructed under the special survey of the Imperial Japanese Government and Lloyds, and is classed as an ocean-going first class vessel by the former and Lloyd's 100 A.1. " with free-board " and L.M.C. She is of the complete superstructure type, with three completely laid decks on the upper deck. There are provided a forecastle deck, a promenade deck amidships and an aft boat deck. A boat deck is also provided above the promenade deck ; and there is a partial fourth deck forward.

Seven transverse watertight bulkheads divide the ertire hull into eight compartments ; namely : engine room, boiler room, four cargo holds and fore and aft peak tanks. These bulkheads have been arranged to conform with the requirements of the International Convention for the Safety of Life at Sea, 1929.

In determining the form of the ship, the builders executed exhaustive experiments with models at their own Experimental Tank, and as a result succeeded in gaining remarkable propelling efficiency. The stem of the vessel is of the flexible type, well-raked forward, having a special peak at the top, giving her a smart appearance. The stern is of cruiser form. A double plate semi-balanced type of rudder is adopted, forming stream-line section in conjunction with the stern frame. Special care has been paid to the form and size of the rudder as well as the dimensions of the propeller bosses. As a result of these improvements, the vessel gave such splendid results as to attain a maximum speed of 19.183 knots on the trial runs carried out off Nagasaki on January 10 this year. With the exception of a slight camber on the beams on the boat deck and at the ends of the upper deck, camber has been



The Steamer "Takachiho Maru" doing 19 knots on her trial run

totally done away with on all decks and also there is on sheer amidships throughout the ship, and this feature gives the public rooms and cabins the appearance of the interior of a land building, the whole making for a feeling of comfort and ease, and the impression felt by the passengers is that they are not on board ship. This lack of camber is an innovation hardly found even in ships flying foreign flags, and this, combined with the form of the hull under water, constitute special points in which the owners and builders may take due pride.

In the construction of the hull, every effort has been made to eliminate the slightest vibration which might be expected from the high speed of the ship, and, as a result of the careful and elaborate way of construction incorporated, no vibration was perceptible, even during the top speed running on the trials, so that those on board could hardly tell whether the ship was under steam or not.

Sitting Room of the 'De Luxe' Suite

Passenger Accommodation

The deck houses on the promenade deck are entirely appropriated for the first class public rooms and cabins, the dining saloon being situated forward and the smoking room aft. The verandah is arranged abaft the smoking room, and the staterooms are arranged between the public rooms. The dining saloon, situated at the foremost part of the promenade deck, embodies the features of interior decoration in modern buildings on land, and is tastefully decorated in rich modern Japanese style, well executed with the use of indirect lighting and modern art glass work and of alloy-metal enrichments, and polished fancy wood combinations. It is surrounded with an enclosed lounge deck having large frameless windows, permitting the passengers to have a broad uninterrupted view irrespective of the weather, and the saloon itself is also provided with large French sash windows of metal work, the floor being laid with rubber. Adjoining the dining saloon, and abaft it, is an entrance hall which gives access to the saloon and the social halls on the boat deck above, by way of a large double-flight staircase.

The style of entrance and lounge was taken from mediaeval Italian Renaissance. A facsimile painting of a famous Italian artist in a gilt frame is hung on the staircase wall. A large arc skylight with stylish stained-glass, diffuses a mild light over the entrance and lounge.

The lounges give a very at-home feeling, are comfortable with large easy chairs and sofas, and have cosy corners for conversation and card-playing. Writing desks are arranged in the aft part of the starboard room.

The decoration of the first class smoking room is of the design of Mr. Jumpei Nakamura, Architecte Français and Professor of Architecture at the Yokohama Higher Technical College. The ample height of the room is very well utilized; large metal sash windows are fitted and the room embodies so-called Japanese modern style. The walls are covered with rich Japanese tissue, specially treated in variegated colors and gold dado. The pillars are lacquered, and the floor covered with rubber. Patent folding window screens are in cloth, and specially designed light stands and furniture are installed. Almost the whole area of the ceiling is of framed glazed glass panels with hidden electric light above. This room represents the latest style of modern Japanese decoration, displaying refinement and originality.

The first class verandah also follows the plans of the same designer. The plan of decoration of all the other public rooms was carried out by the builders' own decorator. All decorative work was executed by the builders themselves.

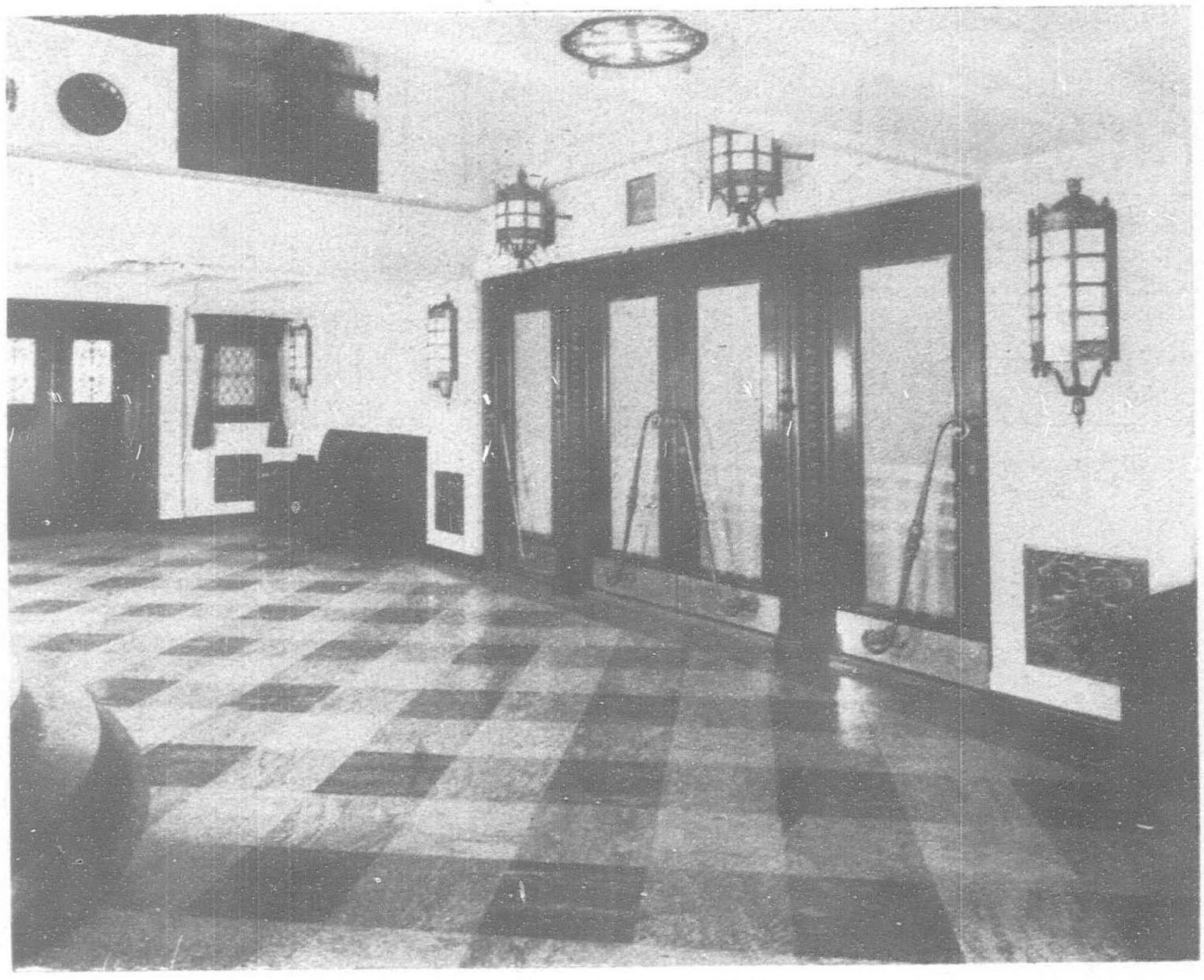
A "De Luxe" suite, comprising sitting room, bedroom and private lavatory and sixteen first class staterooms, some with one berth and sofa berth, and two-berths, are arranged amidships on the promenade deck. The second class cabins are located amidships on the upper deck, and are divided into "A" and "B" classes, the former occupying the fore half, and the latter the aft half.

The second class "A" accommodation comprises eight four-berth and one sofa-berth cabins, and four six-berth and one sofa-berth cabins, while the "B" class consists of five cabins each in Japanese style, the floors covered with Japanese matting. The "A" second class dining room is at the foremost part of the deck house, and abaft it adjoin the smoking rooms on each side of the ship, and further aft the entrance hall for the second class passengers. The dining saloon is decorated in English Renaissance, and the other

Second Class Entrance Hall

rooms are in Spanish style.

The third class accommodation is allotted to almost all the spacious part of the upper 'tween deck. A specially designed grill, in fancy color, having a long dining counter and a number of round high chairs, a corner with tables and upholstered sofas, as well as a well-equipped shop, is on the second deck. Spacious entrances fore and aft on the upper deck—at the same time serving as smoke rooms—are conveniently arranged. Thus it will be noticed that in this ship, numerous novel innovations have been introduced by the owners, and all effectively realized by the builders. Further, it should be mentioned that the third class public cubical baths have been sunk to the deck level, all tiled over, just as may be seen in the bath rooms at any Japanese hot spring resort on land, illustrating another example of an innovation.



First Class Entrance Hall

General Arrangement

The captain's cabin, deck officers' cabins and the wireless telegraph office, account for all the space on the boat deck forward. Above these cabins is the flying bridge, where the chart room and wheel house are arranged. On the port side on the upper deck amidships are the barber's shop, dispensary, chief engineer's cabin, crew's mess-room, and on the port side in the 'tween deck are the engineers' cabins. Adjoining the steering engine room aft, there are situated the clerks' and tally offices. The crew's quarters are below the forecastle, and the stewards' cabin is in the upper 'tween deck forward.

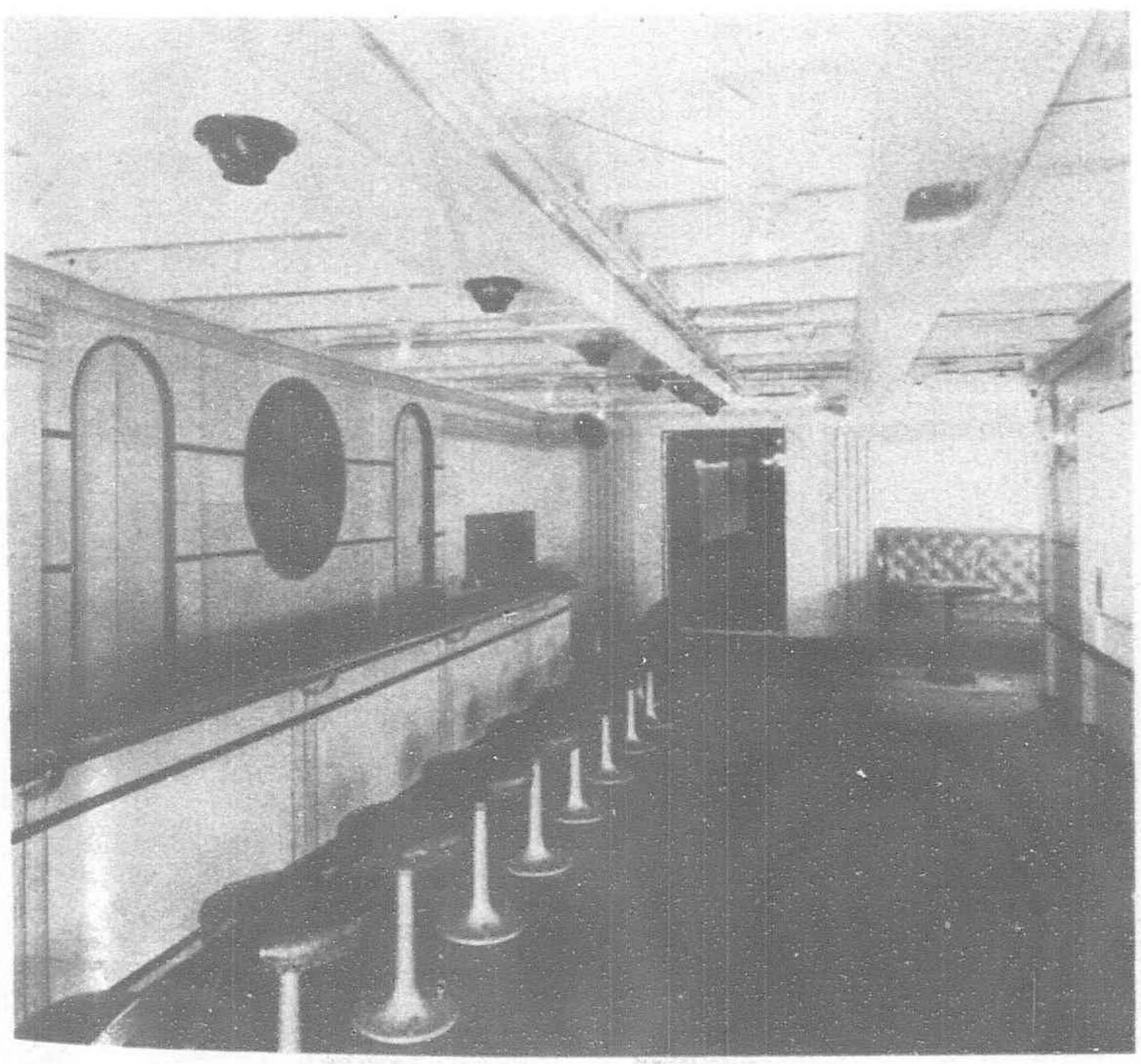
A total of ten open life-boats, each 30-ft. 0-in. long, are provided, eight on the boat deck and two on the aft boat deck, all operated with mechanical davits. A set of emergency D.C. dynamos is fitted on the boat deck, which, in case of emergency, such as the flooding of the engine room, furnishes electric current for the lighting and the working of the life-boats, for the safety of the passengers and crew.

Life jackets, buoys and buoyant apparatus are all amply provided, also in accordance with the requirements of the International Convention for the Safety of Life at Sea, 1929, for short international voyages.

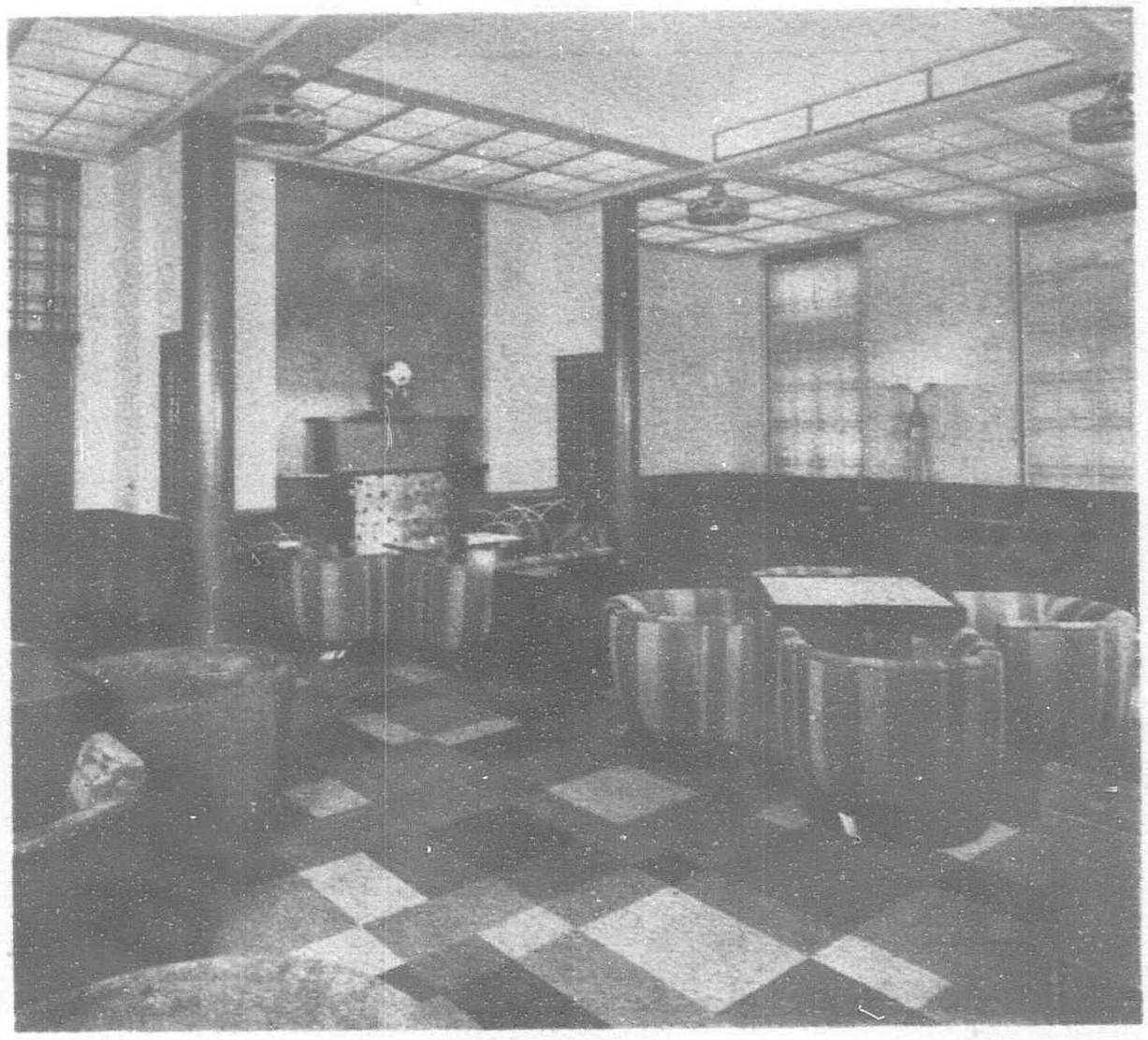
The cargo handling appliances include 10 long Mannesman steel booms and many derrick posts. The vessel, it is intended, will carry bananas and other fruit as the principal cargo on her return trips to Japan, and accordingly, four sets of Ordnance motor fans on the exhaust as well as inlet systems, have been installed for ventilation of the cargo holds. A complete mechanical ventilation system, both inlet and outlet, is also provided for the third class accommodation, galleys, etc. The fans for these purposes number 12 in all, and are of Mitsubishi type and make.

Particulars of Machinery

Excepting a very few small items, all the machinery of the ship is purely home-made, being of Mitsubishi manufacture. The main engines and part of the auxiliary machinery were manufactured by the builders of the ship, the Nagasaki Shipyard & Engine Works of Mitsubishi. Other auxiliaries were supplied by



Third Class Grill Space



First Class Smoking Room

sister works situated at Kobe and Hikoshima (Shimonoseki).

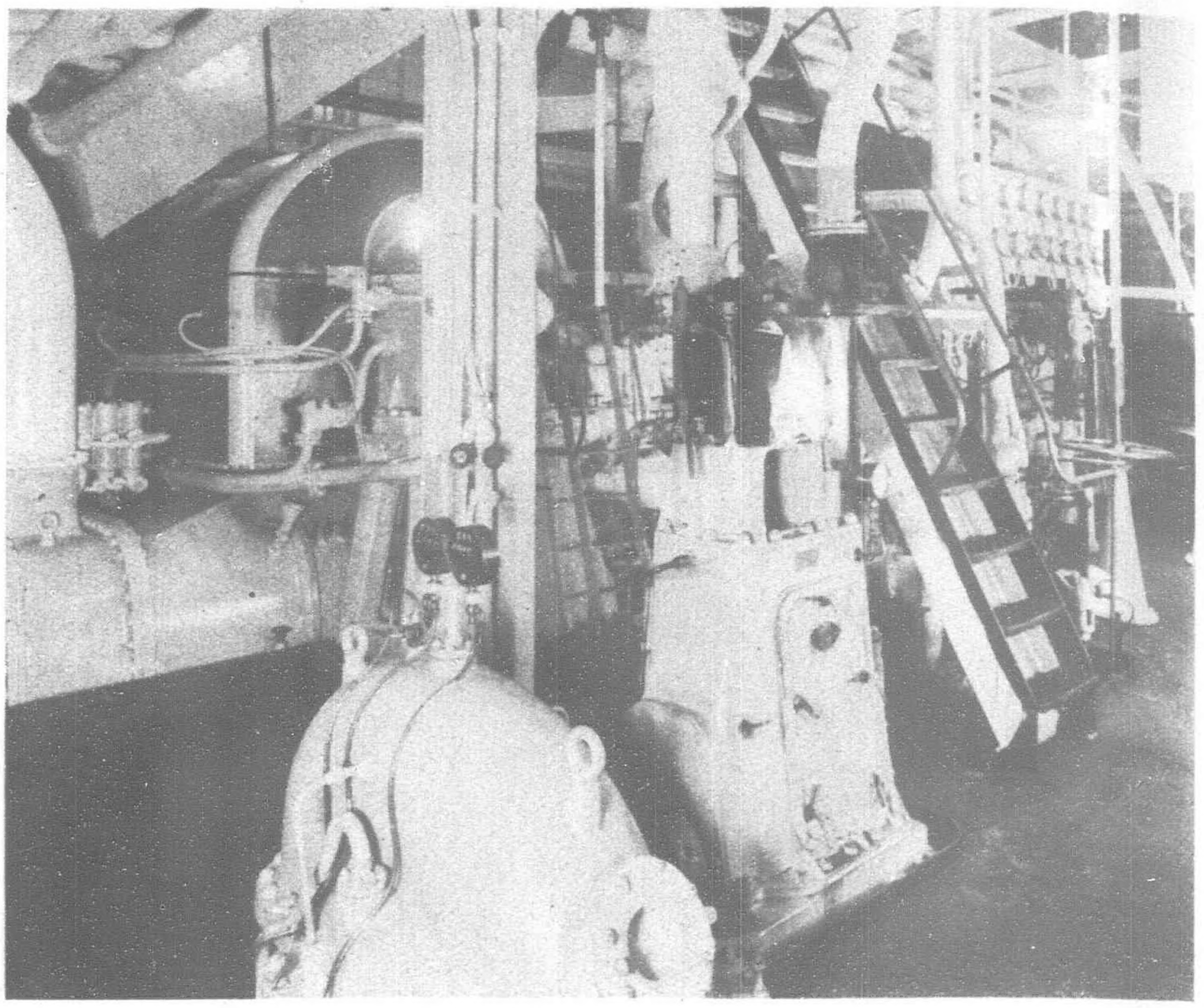
The propelling machinery consists of two sets of Mitsubishi-Zoelly all-impulse cross-compound type turbines, with double reduction gears, and they develop an aggregate normal output of 7,000 s.h.p. at the propeller, at a speed of 110 r.p.m., each set comprising one h.p. and one l.p. ahead turbine, with an astern turbine incorporated in each ahead turbine.

Particulars of the main engines are as follows :—

Steam pressure at the turbine inlet ..	14.5 kgs. per sq. cm.
Steam temperature at the turbine inlet ..	285°C.
Condenser vacuum ..	710 mm.

		Overload	*Normal load*	*Astern running*
Output (s.h.p.)		910	7,000	4,200
r.p.m.	Propeller ..	122	110	89
	H.P. turbine ..	4,965	4,476	3,622
	L.P. „ ..	3,344	3,015	2,439

In order to attain a high efficiency, the turbines are combined with double reduction gears, which enable the turbines to run at sufficiently high revolutions, as previously mentioned. Taking special considerations for smooth running and elimination of troubles of gear teeth under undue stresses, due to torsional vibrations of shafting, the flexible shaft drive system is incorporated. The high pressure turbine discs are solid with the rotor shaft to suit the high revolutions, while those of the low pressure turbines are shrunk on to the rotor shaft with well-fitted keys.



Turbine and Guage Board looking from Front Side of Main Engine Room

Condensing Plant

This installation comprises two sets of main condensers of Mitsubishi-Contraflo type, fitted under the l.p. turbine, having a total cooling surface of 780 sq. meters. The tubes are made of anti-corrosive Albrac material, instead of brass, which is commonly employed.

Two sets of circulating pumps of centrifugal type, with a capacity of 2,250 tons per hour.

Two sets of air pumps, of Weir's "Paragon" type, of a capacity, of 19,000 kgs. per hour.

One set of auxiliary condenser, of Mitsubishi-Contraflo non-vacuum type.

Feed Water System

Two sets of main feed water pumps of Weir's direct-acting type—capacity 60 tons per hour, one set being spare.

Two sets of feed water heaters of the Mitsubishi-Contraflo straight-tube exhaust steam surface type, of which one is h.p. and the other l.p.

One set of "Cascade" type feed water filter.

Lubricating Oil System

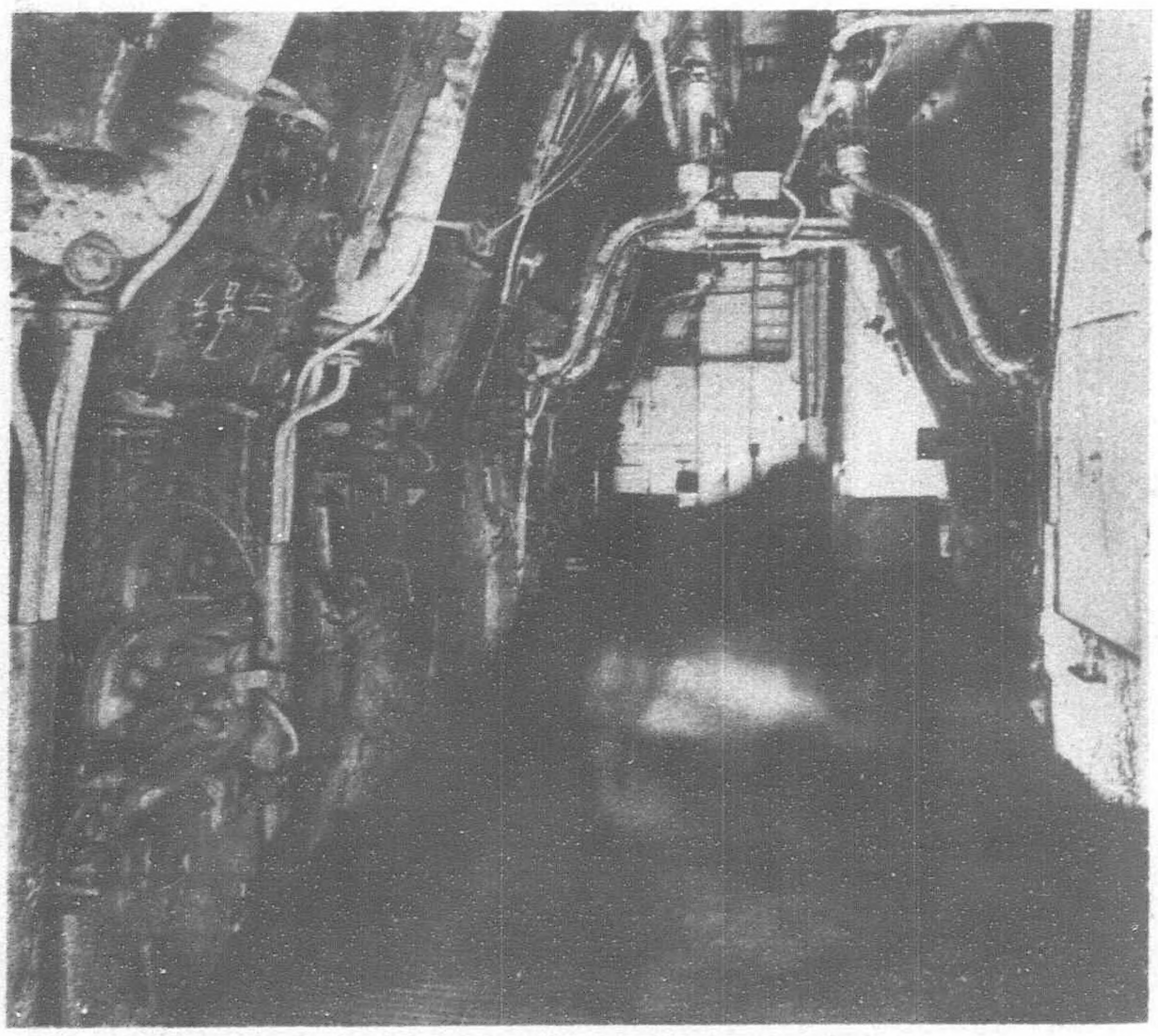
Two sets of lubricating oil pumps of the Mumford direct-acting type—capacity 130,000 kgs. per hour (one set as standby).

Three sets of lubricating oil coolers.

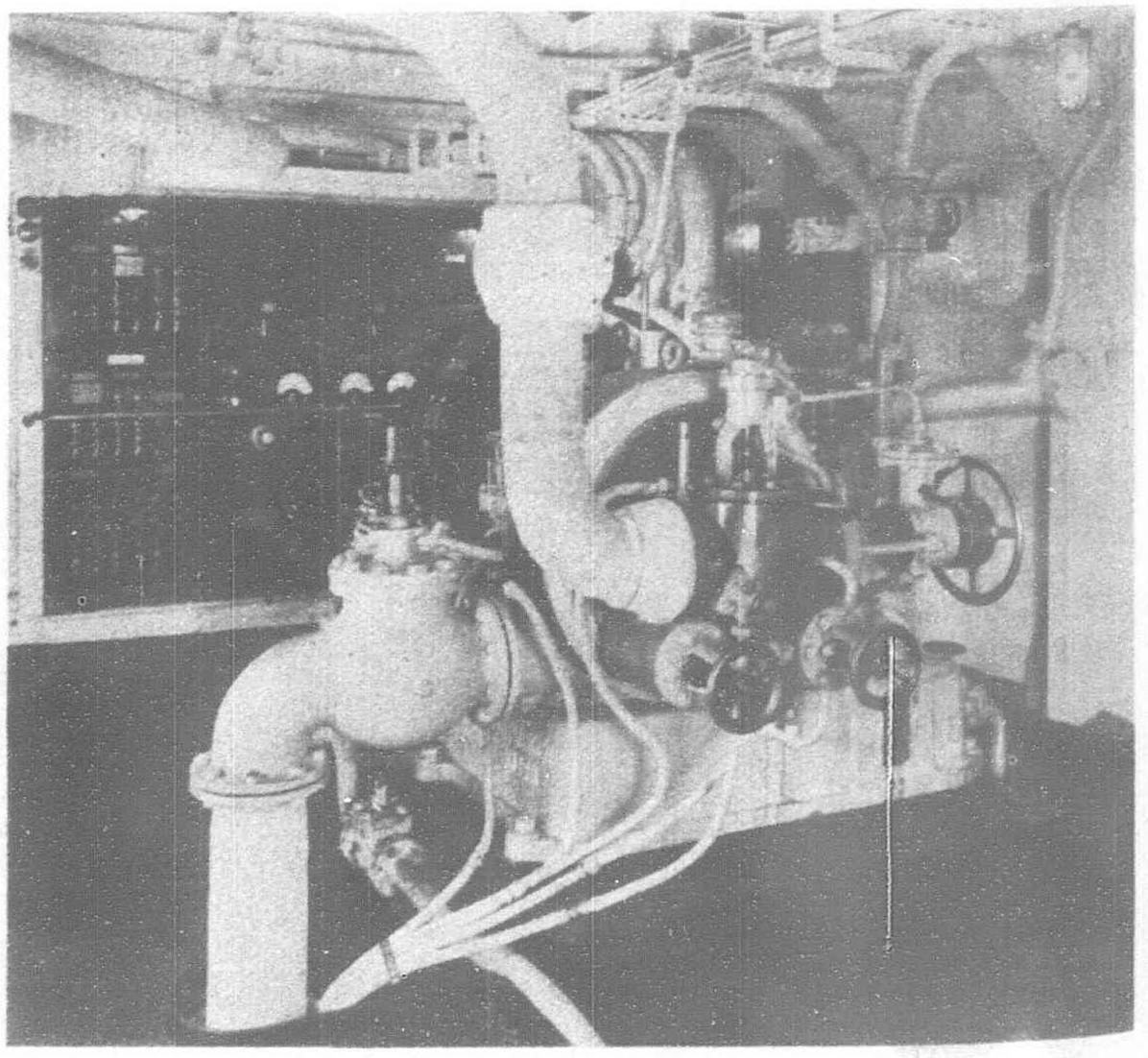
One set of lubricating oil purifier.

Boiler Plant.—Main boilers :—Seven single-ended, multi-tubular marine type, each having a diameter of 4,580 mm. and a

(Continued on page 192)



Forward Boiler Room



80 k.w. Dynamo Engine and Main Switch Board.

Engineering Notes

INDUSTRIAL

NEW MATCH FACTORY.—A new match factory, "Iskr," has started operating in Blagoveschensk. This is completely mechanized, and will turn out 400,000 cases of matches a year.

NEWSPRINT FACTORY.—The Nanking Ministry of Industry proposes to establish a newsprint paper factory in Chekiang with a capital of $5,000,000. Plans for the scheme are expected to be completed in December.

KIRIN CEMENT.—Sanction has been given by the Ministry of Industry of the Manchoukuo Government for founding the Daido Portland Cement Company in Kirin, under Japan-Manchoukuo joint management. The concern will be capitalized at 3,000,000 silver yuan, and its productive capacity will be 110,000 tons a year.

MANCHOUKUO COLLIERY MERGER.—Preparations are being made for a merger of important collieries in Manchuria under a joint Japanese-Manchoukuo concern, which, it is believed, will be formally established this month. The merger will not include the Fushun collieries and the Penchihu colliery on the Mukden-Antung line, these being the only exceptions.

MAGNESIUM AND CEMENT WORKS.—Plans are being completed for the establishment of a magnesium plant under the joint management of the South Manchuria Railway and the Chemical Science Institute of Tokyo. The Onoda Cement Co. at Choushuitzu, in the Kwantung leased territory, is to establish a branch factory at Chuantou, near Ssupingkai, The company is said to have found lime in the neighborhood of Chuantou, after an extensive geological survey along the S.M.R. line.

AUTOMOBILE AND ELECTRIC WORKS.—An understanding for the investment of French capital has been reached between the Manchoukuo Government and M. Andre B. d'Ollivier, head of the Economic Mission sent by l'Association Nationale d'Expansion in Paris, who have been investigating investment possibilities. On M. d'Ollivier's return to Paris, his Association is expected to send experts to Manchoukuo to investigate automobile and electric industries, in which it is proposed to invest French capital.

YELLOW RIVER CONSERVANCY.—With regard to the $10,000,000 river-conservancy fund, the Yellow River Flood Relief Commission instructs that the dykes along both banks of the Yellow River are to be raised to a height one meter above the highest watermark this year. The Commission further instructs that work be started immediately for the repair of the damaged portions of the dykes, as well as for the conservancy of the main tributaries. Shantung Provincial Department of Reconstruction has submitted the following estimates: Dyke repair, $6,399,840; conservancy of Yellow River tributaries, $2,584,770.

PROPOSED CEMENT WORKS.—Under joint investment of the Showa Fertiliser, Showa Steel Tubing and Japan Iodine companies a Portland cement company with a capital of Y.1,000,000 is likely to be founded in Japan. The first-mentioned concern will supply waste coal, the second-mentioned concern waste iron, and the last-mentioned concern waste alumina to the new company for production of alumina-cement, velo-cement and ordinary cement. By producing these the new company hopes to oust foreign products. The company is to have an annual capacity of 500,000 barrels. A factory is likely to be erected at Koyasu in Yokohama.

RAILWAYS

CANTON-HANKOW RAILWAY.—The Canton authorities have decided to make a loan of $1,000,000 for completion of the Lohchang-Tashimun section of the Canton-Hankow Railway. This is in compliance with a request by the manager of the Chuchow-Shaokwan section of the line.

CANTON-HANKOW RAILWAY.—A semi-official report from Nanking states that the Railway Ministry has concluded negotiations with the Hongkong and Shanghai Bank for a loan of $60,000,000 for the completion of the Canton-Hankow Railway. Securities offered are said to be the returned portion of the British Boxer indemnity funds and the receipts of the Canton-Hankow and the Peiping-Hankow Railways. The Chinese Government proposes to set aside £2,500,000 for the purchase of railway materials from Great Britain and £2,000,000 for general expenses on the construction of the new line.

UNDERGROUND RAILWAY IN OSAKA.—The first section of an underground railway in the city of Osaka—that between Umeda and Shinsaibashi—has lately been completed and opened for traffic. The tunnel, which is box-shaped and accommodates two rail tracks, measures approximately 16-ft. in height and 27-ft. in width; its depth below ground varies between 10-ft. and 28-ft. The line is operated on the third-rail system at 750-v D.C., the power being supplied from a sub-station at Umeda, where 22,000-v A.C. is converted to D.C. by two sets of 2,000 kw rotary convertors.

SHIPPING

NAVAL BASE AT CHANGSHAN.—Gen. Han Fu-chu, Chairman of the Shantung Provincial Government, has decided to develop Changshan island, which lies north of the Kiaotung peninsula. The island is directly on the Chefoo-Tangku shipping route, and is considered suitable for a naval base.

HANSHIN HARBOR WORK.—The Hanshin Harbor Construction Company, Osaka, capitalized at Y.10,000,000, a quarter paid up, has decided to start work. Its first enterprise will be the reclamation of 130,000 tsubo of sea area along the Naruo coast between Osaka and Kobe. The second undertaking will be the reclamation of 500,000 tsubo of sea area. The object is the sale of reclaimed land to industrial companies.

CANTON SHIP SCHEME.—The Kuangtung Construction Commissioner has recommended to the provincial authorities the organization of a shipping enterprise. The scheme, it is announced, is to form a corporation with a capital of $2,000,000, one-tenth of which will be advanced by the Government. Business will commence with chartered vessels. When the whole amount of $2,000,000 has been subscribed four steamers will be purchased. The scheme is to maintain direct service between Canton and Swatow, Haikow and Peihai. A shipping service to Annam and Straits ports will be contemplated later.

GERMAN TRAWLERS.—It is announced that arrangements for the purchase of a fleet of fishing boats have been made between the Ministry of Industry and a German Steel Works, under which the German factory will provide the Ministry with seven modern steam-trawlers at a cost of $2,000,000. The boats are to be 150 feet long and equipped with radio, and will operate along the China coast. The trawler ordered by the Kiangsu Provincial Department of Reconstruction from Germany has arrived. It is reported to have cost more than $90,000.—*Finance and Commerce.*

AVIATION

NEW AIR LINE IN SOUTH CHINA.—The formation of a company to operate a regular air mail and passenger service between Canton and Lungkow, in West Kwangsi, is being considered. It is hoped to raise a sum of $1,500,000 as capital.

MACAO AIR LINE.—A number of Chinese merchants in Macao are now contemplating the establishment of a civil air line connecting Macao, Canton, and Hongkong. It is learned that the Kwangtung and Hongkong governments have approved this proposition, and planes will be purchased as soon as suitable sites for aerodromes are found.—*Central Press.*

NEW AERODROME AT NANCHANG.—The immediate construction of a large aerodrome at Nanchang for military purposes is contemplated. The proposed aerodrome will occupy more than 100 mow; and 10,000 workers have been enlisted to level the ground. Several squadrons of fighting aeroplanes recently bought from the United States will be brought to the new aerodrome.

SINO-GERMAN 'PLANE FACTORY PLANNED.—A tentative agreement has been reached between the Nanking Government and the Junker Aircraft Manufacturing Company of Germany for the construction of a joint Sino-German airplane factory in China at a cost of 3,000,000 yuan, of which two-thirds are to be borne by the Chinese Government. The agreement will be signed shortly, it is reported.

MANCHOUKUO'S FIRST AIRCRAFT.—The Mukden Aircraft Arsenal, maintained by the Manchurian Aviation Co., has succeeded in turning out two Fokker passenger monoplanes under licence. These are the first aircraft ever built in Manchoukuo and constructed almost entirely of local materials with the exception of their engines, which are the Nakajima "Kotobuki" air-cooled engines of 460 h.p. On October 5, the company christened the new aircraft in the presence of Lieut.-General Koiso, Chief of Staff of the Kuantung garrison and many dignitaries at the Mukden aerodrome.

COMMUNICATIONS

CANTON'S NEXT BRIDGE.—A new bridge over the Canton river is to be constructed, linking Niukusha with Shihweitang, at the terminus of the Canton-Samshui railway. The bridge will be 1,800-ft. in length, and will cost about $500,000. The contract for its construction has been awarded to an American concern. Another project, the building of a bund in the Honan suburb, will be undertaken by a Chinese company. It will extend from the inner harbor to the foot of the Pearl River bridge, the length being 7,300-ft. and the cost of construction $2,457,000.

MANCHOUKUO COMMUNICATIONS.—The Mukden Telegraphic Administration has commenced the establishment of radio stations at Tunhwa, Tungliao, Taonan, Yingkou and Antung, and to provide long-distance communication between Mukden and Jehol is negotiating for the enlargement of the power plants at the existing stations at Mukden, Shanhaikwan and Peipiao. The newly-formed Manchuria Telegraph and Telephone Co. has commenced on a net-work of telegraph and telephone lines, and a total of 1,475 miles is due for completion by the end of 1934.

The New Osaka Shosen Kaisha Passenger and Cargo Steamer "Takachiho Maru"

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length of 3,660 mm., with a working pressure of 15.8 kgs. per sq. cm, and a steam temperature of 290° Cent.

Auxiliaries for Main Boilers.—Two sets of forced draught fans ; each fan has a diameter of impeller 1,600 mm., and is driven by a single cylinder vertical double-acting steam engine.

One set of fire and ash ejector pumps of the "Iceberg" type, capable of delivering 87 tons per hour.

Two sets of ash ejectors.

Other Auxiliarics.—One set of general service pump of the "Iceberg" type, of a capacity of 110 tons per hour.

One set of bilge and ballast pump, of the "Iceberg" type, of a capacity of 200 tons per hour.

One set of fire and sanitary pump of the "Iceberg" type, with a capacity of 110 tons per hour.

One set of fire and bilge pump of the "Iceberg" type, with a capacity of 60 tons per hour.

One set of fresh water pump of the "Iceberg" type with a capacity of 40 tons per hour.

Generating Plant

Two sets of generators driven by steam turbines, each 80 kw., 110-volts D.C., drip-proof open-marine type.

The funnel is of the aerofoil type and has special air passages along the inside of the outer casing from front to rear side, in order to reduce the vacuum occasioned behind the funnel.